

HOMEPAGE FOR MEDICAL IMAGE PROCESSING

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ABSTRACT

Homepage for Medical Image Processing is a web site development project done to fulfil the requirement of Bachelor of Information Technology course. This homepage is about the current research in medical image processing area done by the research group in Neural Network Lab at Faculty of Computer Science and Information Technology University of Malaya. The architecture of this homepage based on client-server architecture model. Nowadays, many researchers use the Internet to storing, retrieving, and displaying information in a networked environment. Those who offer information through the Web must establish a homepage, a text and graphical screen display that usually welcomes the users and explains the organization that has established the page. For the research group, this home page leads users to other pages, and all the pages of the research group are known as Web site. This homepage is a way where the research group archive their research result and display their result to the user for reference as the main purpose through the Internet. This homepage consist eight modules and each module communicate with each other through the existed link. The eight modules are Home, Research, Publication, Award, People, Gallery, Contact and Links. Home module is the home page, which leads the user to another page in this homepage. Research module contain about the research done by the research group. Publication module contains the publication about the research. Award module contain the award their won. People module contains the profile and e-mail of people who work in the research. Gallery module contains the image display. From Contact module, user can know the address where this research take place and also the e-mail address to contact. This

module also includes a link to University of Malaya map for the direction to the place. The last module is Links module. This module contains the related link to the related project. This homepage build using PHP (Hypertext Preprocessor) for the server-side scripting language. MySQL database is used for storing the research group information.

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University of Malaya

CHAPTER 1

INTRODUCTION

1.1 ABOUT THE BOOK

The book is designed for Medical Image Processing is about to build a
framework for the future research in this field in medical image processing and

Internet is the world most largest and most widely used network. The Internet is an international network of networks that are both commercial and publicly own. The Internet connects hundreds of thousands of different networks from more than 200 countries around the world. More than 300 million people working in science, education, government and business use the Internet to exchange information or perform business transactions with other organizations around the world. Companies and private individuals can use Internet to communicate and collaborate, access information, participate in discussions, supply information, find entertainment and exchange business transactions. Because of the great functions of the Internet, many researchers use the Internet to storing, retrieving, and displaying information in a networked environment. Information is stored and displayed as electronic pages that can contain text, graphics, animations, sound and video. Because of this purpose, the medical image processing research group in Neural Network Lab located at Faculty of Computer Science and Information Technology, University of Malaya need a homepage to storing, retrieving and displaying information about their research group and their research result in a networked environment.

1.1 About the Project

The project, Homepage for Medical Image Processing is about to build a homepage for the current research done in medical image processing area

especially the research that done by the research group in Neural Network Lab at Faculty of Computer Science and Information Technology, University of Malaya.

1.2 The Purpose of Project

The purpose of Homepage for Medical Image Processing project is to provide a homepage for the research group to storing, retrieving and displaying the information about the research group and their research result in a networked environment. The homepage will store and display the people of the research, research result, images they produce during the research and also the publications and award that the research group received.

1.3 The Objective of Project

The main objectives of the Homepage for Medical Image Processing are:

- To provide a web database for the research group to store their research result, the images they produce during the research, the publications such as conference paper, article journal or book about their research and also the awards their received.
- To provide a web database to store the research group personal profile and e-mail address so it is easy for the end user who use this homepage for the information access purpose to know them and contact them about the related project.
- To display the current research in this area and provide online resource for the end user so they can download the information about the research.

1.4 Target User

After the objectives were defined, the next item is to identify who want to use it.

For the Homepage for Medical Image Processing, the target users are:

i. Student

Student who done the research about the related project maybe want to use the resource from this homepage as their reference.

ii. Researcher

The researcher here means the research group or personal those involved in the related project research and maybe want this homepage to be one of their reference sites.

iii. Research group member

The research group also the target user because they will store their current research in the web database and this automatically update the information display in this homepage.

1.5 Project Scope

Homepage for Medical Image Processing consists eight scope modules that are:

i. Home module

This module contains the medical image processing research overview such as the history of the research and the missions and goals of the research. This module is the main module because this module is the main page where the end user can link to the other module.

ii. Research module

This module displays the research or project they had done in medical image processing area.

iii. Publication module

This module contains the publications about medical image processing subject they had published.

iv. Award module

This module contains the award the group member had achieved in medical image processing area.

v. People module

This module displays the list of personal of the research group. This includes their profile, their task in a research project and their e-mail address so the user can contact them.

vi. Gallery module

This module displays the list of images include movies and also 3-D models that are produced during the research.

vii. Contact module

This module contains the address where the research take place and also the e-mail address for end user to contact if they want to know about the a

research in detail. This module also includes the direction map to the research lab.

viii. Links module

This module contains the list of related projects links.

1.6 Project Schedule

Scheduling is an activity that gives the information such as what the activities will be implemented and when it should be implement. In scheduling process for a project, scheduling tool is used such as Gantt chart and PERT chart. For this project, Gantt chart is used to do the scheduling. Figure 1.1 shows the Gantt chart for Homepage for Medical Image Processing development activities scheduling.

The Gantt chart shows the overlapping tasks commonly occur in system development. The Gantt chart does not present the activities implementation order but only present the when the activity should start and when it must be done.

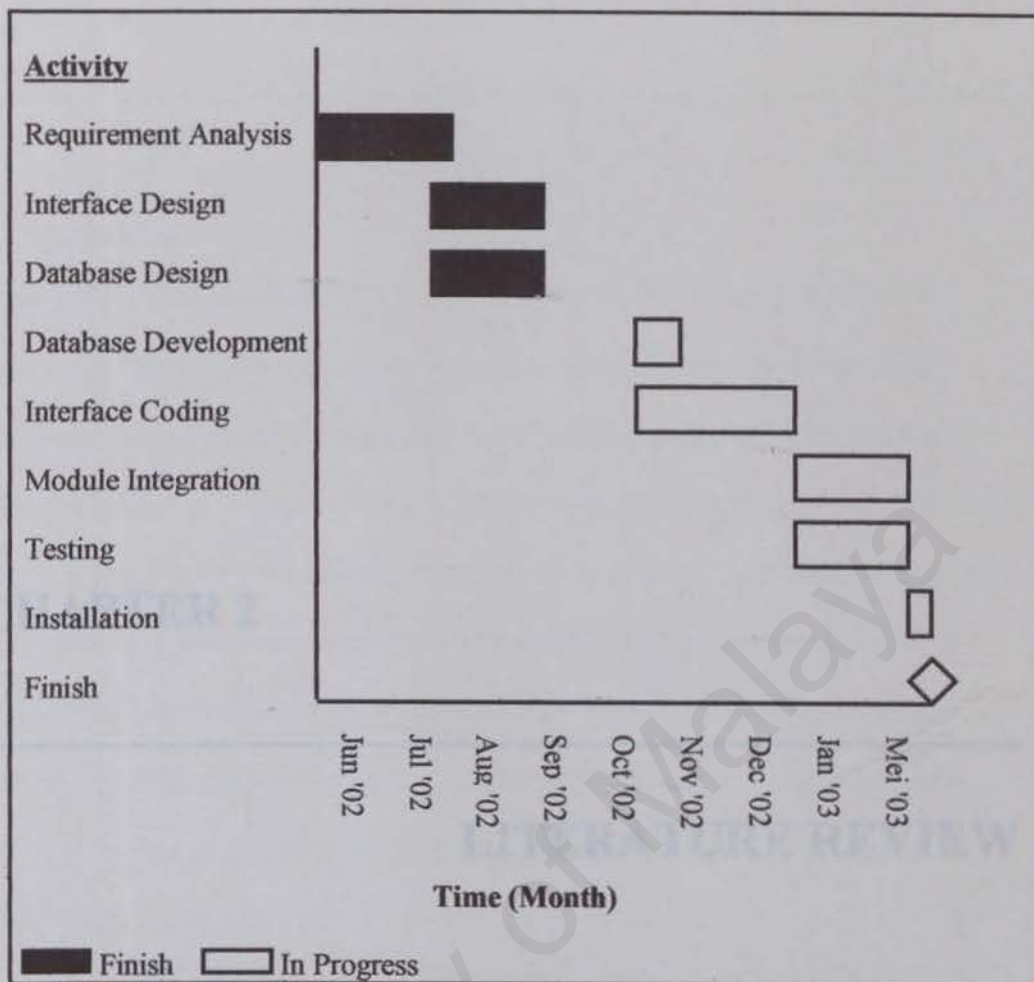


Figure 1.1 Gantt chart for Homepage for Medical Image Processing development activities scheduling

1.7 Summary

Chapter 1 discusses the case study or case definition, the purpose or the objective and the outline of the project development plan. Here, the project development plan presented using Gantt chart.

CHAPTER 1: LITERATURE REVIEW

1.1 Internet World

In the past few years, the Internet has experienced a rapid growth. It has become a global communication network. The act of communicating and exchanging information in this way is called electronic communication. The Internet is a global network of computers and communication lines that connect millions of computers and users around the world. It is a vast network of interconnected computers and communication lines that allow users to exchange information and data. The Internet is a global network of computers and communication lines that allow users to exchange information and data. The Internet is a global network of computers and communication lines that allow users to exchange information and data.

CHAPTER 2

LITERATURE REVIEW

2.1 Internet Study

In the general sense, an Internet is a computer network that connects several other networks. The art of connecting networks in this way is called internetworking.

Internet is the worldwide, interconnected system of computers plus the information and services they provide and their users that uses the TCP/IP suite of protocols. The core networks forming the Internet started out in 1969 as the ARPANET devised by the United States Defence Advanced Research Projects Agency (DARPA). An important step in the development was the National Science Foundation's (NSF) building of a university backbone, the NSFnet, in 1986. Important alien networks that have successfully been accommodated within the Internet include Usenet, Fidonet, and Bitnet.

During the 1990s, the Internet successfully accommodated the majority of previously existing computer networks. This growth is often attributed to the lack of central administration, which allows organic growth of the network, as well as the non-proprietary nature of the Internet protocols, which encourages vendor interoperability and prevents one company from exerting control over the network.

The Internet is held together by bi- or multilateral commercial contracts and by technical specifications or protocols that describe how to exchange data over the network. These protocols are formed by discussion within the Internet Engineering

Task Force (IETF) and its working groups, which are open to public participation and review. These committees produce documents that are known as Requests For Comments (RFCs). The Internet Architecture Board (IAB) raises some RFCs to the status of Internet Standard. Some of the most used protocols are TCP/IP, POP, IMAP, SMTP, HTTP and FTP.

Some of the popular services on the Internet that make use of these protocols are e-mail, Usenet newsgroups, FTP, World Wide Web, Gopher, finger and IRC. E-mail and the World Wide Web are clearly the most used, and many other services are built upon them, such as mailing lists and web logs. The Internet makes it possible to provide real-time services such as web radio and web casts that can be accessed from anywhere in the world.

The most used language for communications in the Internet is English, due to the Internet's origins and to its use in software programming. The net has grown enough in recent years, though, that sufficient native-language content for a worthwhile experience is available in most developed countries.

2.1.1 History of the Internet

The Internet began as a United States Department of Defense Advanced Research Projects Agency network to link scientists and university professor around the world. ARPA created ARPANET as a research project for investigating new network technologies that could enable a military communications network to withstand a

nuclear attack. This involved eliminating single points of failure and designing things to automatically and efficiently work around any failures.

ARPANET was the first major implementation of a packet switching network, a theory first published by Leonard Kleinrock at MIT in 1961. Packet switching was a new important concept in data communications. Previously, data communications were based on the idea of circuit switching, as in typical telephone circuits, where a dedicated circuit is tied up for the duration of the call, and communication is only possible with the machine on the other end of the dedicated circuit. With packet switching, a system could use one communication link to communicate with more than one machine by assembling data into packets, and each packet could be routed independently of other packets.

There were four nodes on the initial ARPANET, known as Interface Message Processors or IMPs. The first four were installed at UCLA, the Stanford Research Institute, UCSB, and University of Utah.

2.1.1.1 The Growth of Internet

The ARPANET was government-funded and therefore restricted to research use only. Commercial use was strictly forbidden. This initially restricted connections to military sites and universities. During the 1980s, as the TCP/IP protocols replaced earlier protocols like NCP, the connections expanded to more colleges and even to a

growing number of companies such as Digital Equipment Corporation and Hewlett-Packard who were participating in research projects.

Regional TCP/IP-based networks such as NYSERNet (New York State Education and Research Network) and BARRNet (Bay Area Regional Research Network) grew up and started interconnecting with the ARPANET. This greatly expanded the reach of the growing network, and to a great extent was the point where the ARPANET turned into the Internet.

At the end of the 1980s, the US Department of Defense decided the network was developed enough for its initial purposes, and decided to stop further funding. The US National Science Foundation, another branch of the US government, took over responsibility for the core Internet backbone. In 1989 the NSFNet backbone was established, the US military broke off as a separate MILNET network, and the ARPANET was shut down.

2.1.2 Internet Technology and Capabilities

The Internet is based on client/server technology. Individuals using the Net control what they do through client applications such as Web browser software. All the data are stored on servers. A client uses the Internet to request information from a particular Web server on a distant computer, and the server sends the request information back to the client via the Internet.

2.1.2.1 Client-side Platform

Client platforms today include not only PCs and other computers but also a wide array of handheld devices and information appliances, some of which can even provide wireless Internet access. Table 2.1 lists some of the client devices.

Device	Description
PC	General purpose computing platform that can perform many different tasks, but can be unreliable or complex to use. Example: Dell, Compaq, IBM PCs
Net PC	Network computer with minimal local storage and processing capability. This device designed to use software and services delivered over networks and the internet. Example: Sun Ray
Pager	Provides limited e-mail and Web browsing. Example: Blackberry
Smart Phone	Device with a small screen and keyboard for browsing the Web and exchanging e-mail in addition to providing voice communication. Example: Qualcomm pdQ™ smart phone
Game Machine	Game machine with a modem, keyboard and capabilities to function as a Web access terminal. Example: Sega Dreamcast

PDA	Wireless handheld personal digital assistant with e-mail and internet service. Example: Palm VII
E-mail machine	Tablet with keyboard that provides textual e-mail capabilities. This device requires linking to an e-mail service. Example: MailStation
Set top box	Provides Web surfing and e-mail capabilities using a television set and a wireless keyboard. Example: WebTV

Table 2.1: Example of Internet Client Platforms

2.1.2.2 Web Server

Servers dedicated to the Internet services are the heart of the information on the Net. One or more software programs implement each Internet service. All the services may run on a single server computer or different services may be allocated to different machines.

Web server software receives requests for web pages from the client and accesses the Web pages from the disk where they are stored. Web servers can also access other information from databases and return that information to the client in the form of Web pages desired. The most popular Web server programs are Apache HTTP Server, Microsoft Internet Information Server (IIS) and iPlanet Enterprise Server.

2.1.2.2.1 Apache HTTP Server

Apache is the most widely used Web server in the commercial world. More Web site use Apache than any other server. Apache has gained this status despite or maybe because of its freely available and unmarketed nature. Apache was developed by a large group of volunteers. Apache is primarily a UNIX-based server. Apache does not include any graphical utilities to help the user to set it up. The users have to edit the Apache configuration files using a text editor.

2.1.2.2.2 Microsoft Internet Information Server

IIS is included with Windows NT Server and is only available in the Windows NT Server version. IIS includes a graphical configuration utility that lets the user to configure the server via a Web browser that's running on user desktop machine.

2.1.2.2.3 iPlanet Enterprise Server

iPlanet software runs on many operating system including Unix, Solaris and Windows. Using iPlanet server, information can send safely and securely over the Web. IPlanet server has the advantage of being the most commonly used secure server on the Internet.

2.1.2.3 Internet Tools for Communication

2.1.2.3.1 Electronic Mail (E-mail)

The Internet has become the most important e-mail system in the world because it connects so many people worldwide. Researchers use this facility to share ideas,

information, even documents. E-mail over the Internet also has made possible many collaborative research and writing projects, even though the participants are thousands of miles apart. With proper software, the user will find it easy to attach documents and multimedia files when sending a message to someone or to broadcast a message to a predefined group.

2.1.2.3.2 Usenet Newsgroups (Forums)

Usenet newsgroups are worldwide discussion groups in which people share information and ideas on a defined topic. Discussion takes place in large electronic bulletin boards where anyone can post messages for others to read.

2.1.2.3.3 LISTSERV

LISTSERV is a type of public forums. It's allows discussions to be conducted through predefined groups but uses e-mail mailing list servers instead of bulletin boards for communication. If user find a LISTSERV topic they are interested in, they have to subscribe. From then on, through user e-mail, they will receive all messages sent by others concerning that topic. The user can, in turn, send a message to their LISTSERV and it will automatically be broadcast to the other subscribers.

2.1.2.3.4 Chatting

Chatting allows two or more people who are simultaneously connected to the Internet to hold live, interactive conversations. Chat groups are divided into channels and each is assigned its own topic of conversation. The first generation of chat tools

was for written conversations in which participants type their remarks using their keyboard and read responses on their computer screen. System featuring voice chat capabilities such as Excite are now becoming popular. A new enhancement to chat service called instant messaging system even allows participants to create their own private chat channels. The instant messaging system alerts a person whenever someone on his or her private list is on-line so that the person can initiate a chat session with that particular individual. Examples of instant messaging systems are Yahoo Messenger and MSN Messenger.

2.1.2.3.5 Telnet

Telnet allows someone to log on to one computer system while doing work on another. Telnet is the protocol that establishes an error-free, rapid link between the two computers, allowing the user, for example, to log on into their business computer from a remote computer when they are on the road or working from home. User can also log on to use third-party computers that are accessible to the public, such as the catalogue of the University of Malaya Library. Telnet uses the computer address the user supply to locate the computer the user want to reach and connect user to it.

2.1.2.4 Information Retrieval on the Internet

Information retrieval is a basic Internet function. Many hundreds of library catalogue are on-line through the Internet. Users are able to search many thousands of databases that have been opened to public by corporations, governments and non-profit organizations. Individuals can gather information on almost any conceivable topic stored in these databases and libraries. Many use the Internet to locate and

download some of the free, quality computer software that has been made available by developers on computers all over the world. The two important methods of accessing computer and locating files are FTP (File transfer protocol) and Gophers.

2.1.2.4.1 FTP

File transfer protocol (FTP) is used to access a remote computer and retrieve files from it. FTP is quick and easy if user know the remote computer site where the file is stored. After user have logged on to the remote computer, user can move around directories that have been made accessible for FTP to search for the files user want to retrieve. Once the files are located, FTP makes transfer of the file to user own computer very easy.

2.1.2.4.2 Gophers

A gopher is a computer client tool that enables the user to locate information stored on Internet gopher servers through a series of easy-to-use, hierarchical menus. The Internet has thousands of gopher server sites throughout the world. Each gopher site contains its own system of menus listing subject-matter topics, local files and other relevant gopher sites. One gopher site might have as many as several thousand listings within its menus. When user use gopher software to search a specific topic and select a related item from a menu, the server automatically transfers the user to the appropriate file on that server or to the selected server, which it is located. Once on that server, the users are presented with more menus of files and other gopher site

servers that might interest the user. User can remove from site to site, narrowing their search as they go, locating information anywhere in the world.

2.2 The World Wide Web

The **World Wide Web (WWW)** is a hypertext system that operates over the Internet. To view the information, one uses a piece of software called a web browser to retrieve pieces of information from web servers and display them on the user's screen. The user can then follow hyperlinks on the page to other documents or even send information back to the server to interact with it. The act of following hyperlinks is often called surfing the web.

The core functionality of the Web is based on three standards: The URL, which specifies how each page of information is given a unique address at which it can be found; HTTP, which specifies how the browser and server send the information to each other, and HTML, a method of encoding the information so it can be displayed on a variety of devices.

2.2.1 URL

To access a Web site, the user must specify a **uniform resource locator (URL)**, which points to the address of a specific resource on the Web.

2.2.2 HTTP

HTTP stands for **hypertext transport protocol**, which is the communications standard used to transfer pages on the Web. HTTP defines how messages are formatted and transmitted and what actions Web servers and browsers should take in response to various commands.

2.2.3 HTML

Hypertext Markup Language (HTML) is a page description language for creating hypertext or hypermedia documents such as Web pages. HTML uses instructions called tags to specify how text, graphics, video and sound are placed on a document and to create dynamic links to other documents and objects stored in the same or remote computers. These links allow a user to simply point at a highlighted key word or graphic, click on it and immediately be transported to another document. Web server software manages the requests for these HTML documents on the computer where they are stored and delivers the HTML document to the user's computer.

HTML programs can be custom written, but they also can be created using the HTML authoring capabilities of Web browsers or of popular word processing, spreadsheet, and data management and presentation graphics software packages. HTML editors such as Macromedia Dreamweaver, Microsoft Frontpage and Homesite.

2.3 Web Browser

Web browsers are easy-to-use software tools for displaying Web Pages and for accessing the Web and other Internet resources. Web browser software features a point-and-click graphical user interface that can be used throughout the Internet to access and display information stored on computers at other Internet sites. Browsers can display or present graphics, audio and video information as well as traditional text, and they allow you to click on-screen buttons or highlighted words to link to related Web sites. Web browsers have become the primary interface for accessing the Internet or for using networked systems based on Internet technology. The two leading commercial Web browsers are Microsoft's Internet Explorer and Netscape Navigator, which is also available as part of the Netscape Communicator software suite.

2.4 PHP (Hypertext Preprocessor)

PHP is an open-source server-side HTML-embedded Web scripting language that is compatible with the entire major web server, most notably Apache. PHP allows us to embed code fragments in normal HTML pages – code that interpreted as our pages are served up to users. PHP also serves as a 'glue' language, making it easy to connect our Web pages to server side database.

The reasons for using PHP as the scripting language are:

- PHP is free because it is open source software and it costs nothing.
- PHP is easy to learn compared to the other ways to achieve similar functionality language before we can make a trivial database call. PHP has a syntax that is

quite easy to parse and human friendly. PHP doesn't make you learn two different programming languages for different occasion.

- PHP is embedded within HTML. PHP pages are ordinary HTML pages that escape into PHP mode only when necessary. PHP can quickly added to code produced by WYSIWYG (What You See Is What You Get) editors. PHP lends itself to a division of labour between designers and scripters. Every line of HTML does not need to be rewritten in a programming language. PHP can reduce labour costs and increase efficiency.
- PHP is cross-platform because it runs native on every popular flavour of UNIX and Windows. PHP compatible with three leading Web server such as Apache HTTP Server, Microsoft Internet Information Server and Netscape Enterprise Server.
- PHP isn't tag based but it is a real programming language. PHP can define functions to your heart's content just by typing a name and definition.
- PHP is stable that the server doesn't need to be rebooted often and the software doesn't change radically and incompatibly from release to release.
- PHP is fast.
- PHP is open
- PHP play well with other
- PHP is popular and growing for so-called two-tier development.
- PHP is not proprietary.

2.5 Analysis of Existing Homepage

2.5.1. The Computer Vision Homepage



Figure 2.1: The Computer Vision Homepage interface

Advantage:

This homepage give the user description of every page in the home page and also the content of each page.

Disadvantage:

User need to browse the page until at the end of the home page to read the description of the homepage. Sometime user doesn't want to waste their time to browse the page.

2.5.2 LKEB Homepage

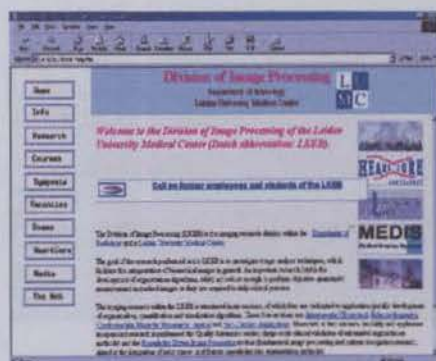


Figure 2.2: LKEB Homepage interface

Advantage

The homepage tell the user all about the research lab at the first page and use the icon to lead user to the other pages.

Disadvantage

The use of frame make the information divides into a small window. This can make the user can't to mark this page as bookmark and make the URL stop.

2.5.3 MIPL Homepage

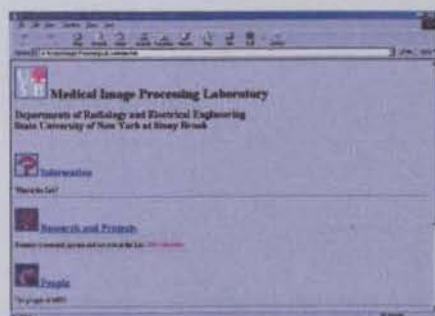


Figure 2.3: MIPL Homepage interface

Advantage:

- This homepage is very simple and it is not complex for user to understand how to go through this site.
- The information displays in regular order.

Disadvantage:

- Does not display the information about the research group at the front page because maybe user does not interested to clicking the introduction link to read about their organization or research group.

2.6 Data Collection Technique

Research Group

All the data about the research are already exist and it is ready to key in it in the database.

Interview

Interview the research group people to get their profile and the task they do in a research project.

2.7 Summary

This chapter discusses the problem analysis before the project implemented. It's included the study and analysis on the existed system, and the study about the techniques to use and the study about the domain of the project.

CHAPTER 3

METHODOLOGY

Methodology is a set of theories or principles that explain a field, field, and techniques that are used to study that field. The methodology of this research is a research development. Usually, the methodology used by system experts based on their experience or a field. A review of the development of this methodology is provided and the methodology can refer to it. Some of the system development that are the methodology of the methodology used, as follows:

CHAPTER 3

Methodology is a research method that describes the methodology of a research study. The methodology includes the development, selection and use of data and the use of the

METHODOLOGY

Methodology includes the development, selection and use of data and the use of the methodology of the methodology. The methodology of this research is a research development. Usually, the methodology used by system experts based on their experience or a field. A review of the development of this methodology is provided and the methodology can refer to it. Some of the system development that are the methodology of the methodology used, as follows:

3.1. Research Method

Research is a study that is conducted to find out the truth. The methodology of this research is a research development. Usually, the methodology used by system experts based on their experience or a field. A review of the development of this methodology is provided and the methodology can refer to it. Some of the system development that are the methodology of the methodology used, as follows:

Methodology is a set of complete reference that consist models, tools and techniques that must be followed during the implementation of the activities in a system development. Usually, the methodology created by system expert based on their experience in this field. After that, the documentation of this methodology is produced and the organization can refer to it. Some of the system developer buy or get the methodology from another organization such as consultant firm or vendors.

Methodology is a document about the detailed activities for the system developer to implement, include the documentation design and the reports that must be prepared. Some of the methodology maybe simple and only consist the general instructions about what activities will be implemented. There are many type of methodology such as waterfall model, V-model and prototyping model used to decompose the activities of system development. Different system processes decompose these activities in different ways. For the Homepage For Medical Image Processing, prototyping model is used to describe the set of activities and associated results, which produce the homepage.

3.0 Prototyping Model

Sometime it is hard for the end user to express their real requirements. Prototyping consists of building an experimental system rapidly and inexpensively for end users to evaluate. By interacting with the prototype, the end users can get a better idea for

their information requirements. The prototype endorsed by the users can be used to create the final system.

The prototype is a part of the system but it is meant to be only a preliminary model. Once operational, the prototype will be further refined until it conforms precisely to user's requirements. Once the design has been finalized, the prototype can be converted to a polished production system.

3.1 Advantages and Disadvantages of Prototyping

Prototyping is most useful when there is some uncertainty about requirements or design solutions.

Prototyping is especially valuable for the design of an information system's end-user interface. The prototype enables users to react immediately to the parts of the system with which they will be dealing.

Prototyping encourages intense end-user involvement throughout the systems development lifecycle and thus is likely to produce systems that fulfil user requirements. However, rapid prototyping can gloss over essential steps in systems development. Once finished, if the prototype works reasonably well, management may not see the need for reprogramming, redesign or full documentation and testing. Some of these hastily constructed systems may not easily accommodate large quantities of data or a large number of users in a production environment. Successful prototyping requires management and mechanisms for defining expectations, assigning resources, signalling problems and measuring progress.

3.2 Steps in Prototyping

A process model for prototype development is shown in Figure 3.1. The objectives of prototyping should be made explicit from the start of the process. The objective is to develop a homepage to prototype the user interface.

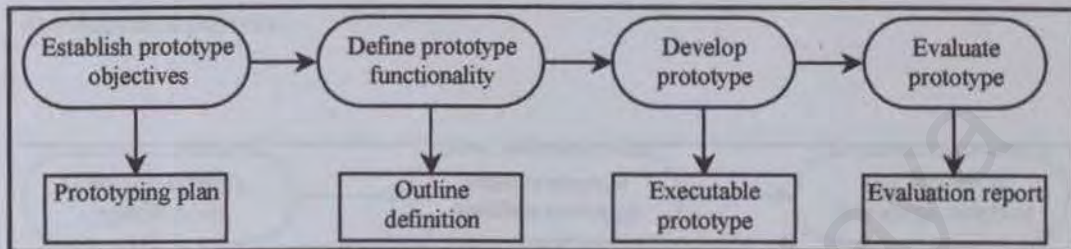


Figure 3.1: The process of prototype development.

The first stage is establish prototype objectives where at this stage, the user's basic requirements are identified and after capture the user basic information needs, the prototyping is planned. The next stage in the process is to decide what to put into and what to leave out of the prototype system. After that, the interface prototype is developed using the Web page editor. The final stage of the process is prototype evaluation. The user is encouraged to work with the system in order to determine how well the prototype meet the user needs and to make suggestions for improving the prototype.

3.3 Prototyping in Homepage Development Process

In Homepage Development Process, the evolutionary prototyping is used. It is based on the idea of developing an initial implementation, exposing this to user comment and refining this through many stages until an adequate system has been developed.

Evolutionary prototyping is the only realistic way to develop systems where it is difficult to establish a detailed system specification.

The key of success in this approach is to use techniques, which allow for rapid system iterations. Suggested changes may be incorporate and demonstrated as quickly as possible. Figure 3.2 shows the evolutionary prototyping for the Homepage development process.

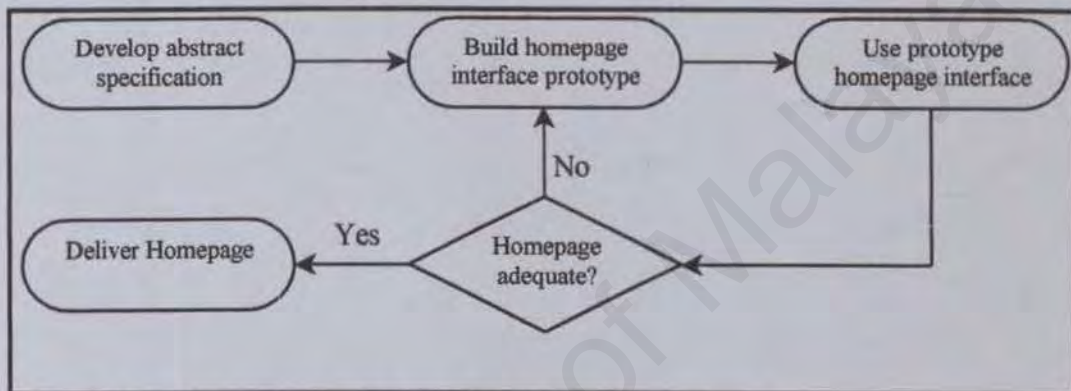


Figure 3.2: Evolutionary Prototyping for the Homepage

3.4 User Interface Prototyping

User interfaces have now become the norm for interactive systems. The effort involved in specifying, designing and implementing a user interface represents a very high significant part of application development costs. It is not acceptable for designers simply to impose their view of an acceptable user interface on users. The user must take part in the interface design process.

Evolutionary prototyping is used in the process of interface prototyping. An initial Web interface is produced, evaluated with users and revised until the user is satisfied

with the homepage. After an acceptable interface has been agreed on. It then may be re-implemented.

3.5 Summary

This chapter discusses a detailed description about the research method and the technique used to solve the project problem. For this project, prototyping model is used to represent the development process of the homepage.

CHAPTER 4

SYSTEM ANALYSIS

System analysis is a detailed examination about what happens from the system and how to help with support, an example system where a user receives information and feedback. In this phase, a model of design was proposed but very few details will be needed for functional investigation to design phase.

CHAPTER 4

SYSTEM ANALYSIS

4.1 Functional Requirements

Functional requirements refer to the system or service that a user expects to have. The system should provide a service that is required for business. For example, a functional requirement for a business management system is:

- To allow the user to create a new record or get data from the system.
- To allow the user to delete a record by the number of the record.
- To allow the user to update a record by the number of the record.
- To allow the user to search for a record by the number of the record.
- To allow the user to print a record by the number of the record.
- To allow the user to delete a record by the number of the record.
- To allow the user to update a record by the number of the record.
- To allow the user to search for a record by the number of the record.
- To allow the user to print a record by the number of the record.
- To allow the user to delete a record by the number of the record.

System analysis involve the detailed explanation about what function does the system implement to help and support an organization achieve the objective efficiently and effectively. In this phase, a variety of design was proposed but only one design will be chosen for the detailed investigation in design phase.

4.0 System Requirement

System requirement refer to the description of functions that the system will implement. Generally, system requirement include three categories that are functional requirement, non-functional requirement and technical requirement.

4.1 Functional Requirement

Functional requirements refer to the activities or service the system should provide, how the system react to particular inputs and how system should behave in particular situations. For Homepage For Medical Image Processing, the functional requirements are:

- To store and display the current or previous researches or projects done in the medical image processing field.
- To store and display the publications produced by the member of the research group.
- To store and display the awards information won by the research group.
- To store and display the people profile who involve in this research field.
- To store and display the images, movies or 3-D model produced in this research.

4.2 Non-functional Requirement

Non-functional requirement refer to the constraints on the services or functions offered by the system. These include:

- **System respond time**

10s-15s is the maximum time for the Web page to respond the users so those users are not boring when they surf the homepage.

- **User-friendly**

The homepage interface must be user-friendly so the users understand how to surf the site and interested to surf through the site for the research purpose.

- **Information quality and security**

This mean the information produced is free from error, complete, relevant and timely. The information must have the security feature to avoid the information changing by the unknown person.

- **Consistent interface**

The Web interface design must be consistent so user did not confuse if they go to the other page.

4.3 Technical Requirement

Technical requirement refer to the operating environment such as hardware and software and programming language.

4.3.1 Hardware Requirement

- Intel (or equivalent) Pentium processor
- 128MB

- 200MB of disk storage space
- 24-bit colour

4.3.2 Software Requirement

- **Red Hat Linux operating system**

Linux is an open source UNIX-like operating system that was originally designed to run on the x86 platform (PC), and as such, Linux supports most of the features found in any UNIX variant.

- **Linux Text Editor**

Under Linux, PHP scripts created using a ordinary text editor program such as emacs or gedit.

- **PHP 4.0**

PHP 4.0 is a popular scripting language used to create powerful and dynamic web sites. PHP stands for Hypertext Preprocessor. PHP is open source software, which means it is available free of charge. It is a "plug-in" for Web server that will allow it to do more than just send plain Web pages when browsers request them. With PHP installed, Web server will be able to read a new kind of file which is called a PHP script that can do things like retrieve information from a database and insert it into a Web page before sending it to the browser that requested it. PHP is completely free to download and use.

- **Apache web server**

Before publish PHP pages, a Web server must be install. Apache is a web server package that works under Linux as well as under other operating systems.

Apache is free or available at modest costs.

- **MySQL database**

MySQL is the database program most commonly used to develop database-driven PHP Web sites. MySQL is a fast, efficient program that is available for use on Unix and Windows computers. MySQL is suitable for small to medium-sized projects and requires very few system resources to run. MySQL is also an Open Source product, which means this software is free of charge. Although MySQL is very powerful, it is relatively easy to install and manage. This makes it a good program for new developers to use when learning to work with databases using PHP.

- **Mozilla Web Browser**

Mozilla is an open source browser that is designed from the ground up to support open internet standards across a variety of platforms including Windows, Linux, Mac OS x, OS/2, Solaris, and many more. Mozilla provides users with acclaimed browsing convenience along with power features such as pop up blocking and tabbed browsing.

- **Adobe Photoshop 6.0**

Adobe Photoshop 6.0 is a tool to create the web graphic element such as icon and banner.

4.4 Summary

System analysis involved the detail description about the task that a system implements to help and support the organization to achieve the objective effectively and efficiently. The activity involved in system analysis is identifying the system requirement. There are three categories of system requirement: functional requirement, non-functional requirement and hardware and software requirement. To develop this homepage, LAMP is used. LAMP stands for Linux, Apache, MySQL and PHP and this is the open source package.

System design includes all the tasks and activities that occur from the time the detailed specifications based on user requirements are being developed to when details are called system physical design. It is known as software system development implementation based on data, process and interface design.

5.1 Introduction to System Design

CHAPTER 5

System design is the process of defining the architecture, components, modules, interfaces, and data for a system to meet the requirements specified in the user requirements document. It is the process of defining the system architecture, components, modules, interfaces, and data for a system to meet the requirements specified in the user requirements document. It is the process of defining the system architecture, components, modules, interfaces, and data for a system to meet the requirements specified in the user requirements document.

SYSTEM DESIGN

5.1.1 Data Flow Diagram (DFD)

For this purpose, Data Flow Diagram (DFD) is used to represent the logical process design. A Data Flow Diagram (DFD) is a graphical representation of the data flow in a system. It is used to represent the data flow between different components of a system. The data flow is represented by arrows, and the components are represented by rectangles. The data flow is represented by arrows, and the components are represented by rectangles.

DFD is the most widely used tool to represent all the process design. DFD is used for analysis and design of the system. It is used to develop the logical system architecture and design. Using the graphical representation, DFD is used to design the physical architecture and development of the system.

System design includes all the tasks and functions that give the priority to detailed specification based on computer based problem solution. Sometime system design also called system physical design. It's focus to technical aspect and system implementation based on data, process and interface component.

5.1 Homepage Architecture Design

Homepage architecture refer to the selection and determination of method or technology that will be use to develop and implement the homepage. It needed to determine how to perform and represent data, process and interface and the elements interaction so that the homepage is easy to understand and transmitted to another user using the communication network.

5.1.1 Physical Process and Structure Chart

For this purpose, Data Flow Diagram (DFD) is used to represent the involved process stages. After that, DFD will be transformed into structure diagram form contain the modules that will be used in this homepage. From this structure diagram and module, the pseudocode can be determined.

DFD is the main tool to represent all the process stages. DFD is used for system analysis tool to design the logic relation to develop the homepage application architecture. Using the graphic representative, DFD is used as a system design tool to design the physical architecture and development of the system.

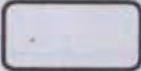
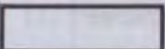
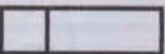

Convention	Description
	Present the process that can be see obviously in a system implemented by a computer or human or the technical implementation for the specific task such as computer programming and manual process.
	Present the external entity . External entity can be classified during the system analysis from the system environment.
	Present the data storage . This convention presents the implementation of database, table in database, computer file, tape, any file needed for the program and any type of file.
	Present the data flow . Data flow represent planned implementation to input or output from physical process, instruction or database action such as designing, reading, updating, or deleting the data, data import and export to the another system through the network and data flow between two module in the same program.

Table 5.1: DFD Convention and Their Description

5.1.1.1 Physical Data Flow Diagram For The Homepage

The DFD is used to present and design the technology options and design result for all the logic process, data flow and data storage. The chart is designed during the system design in a project. The use of graphic representative or the DFD convention for this project show in Figure 5.1

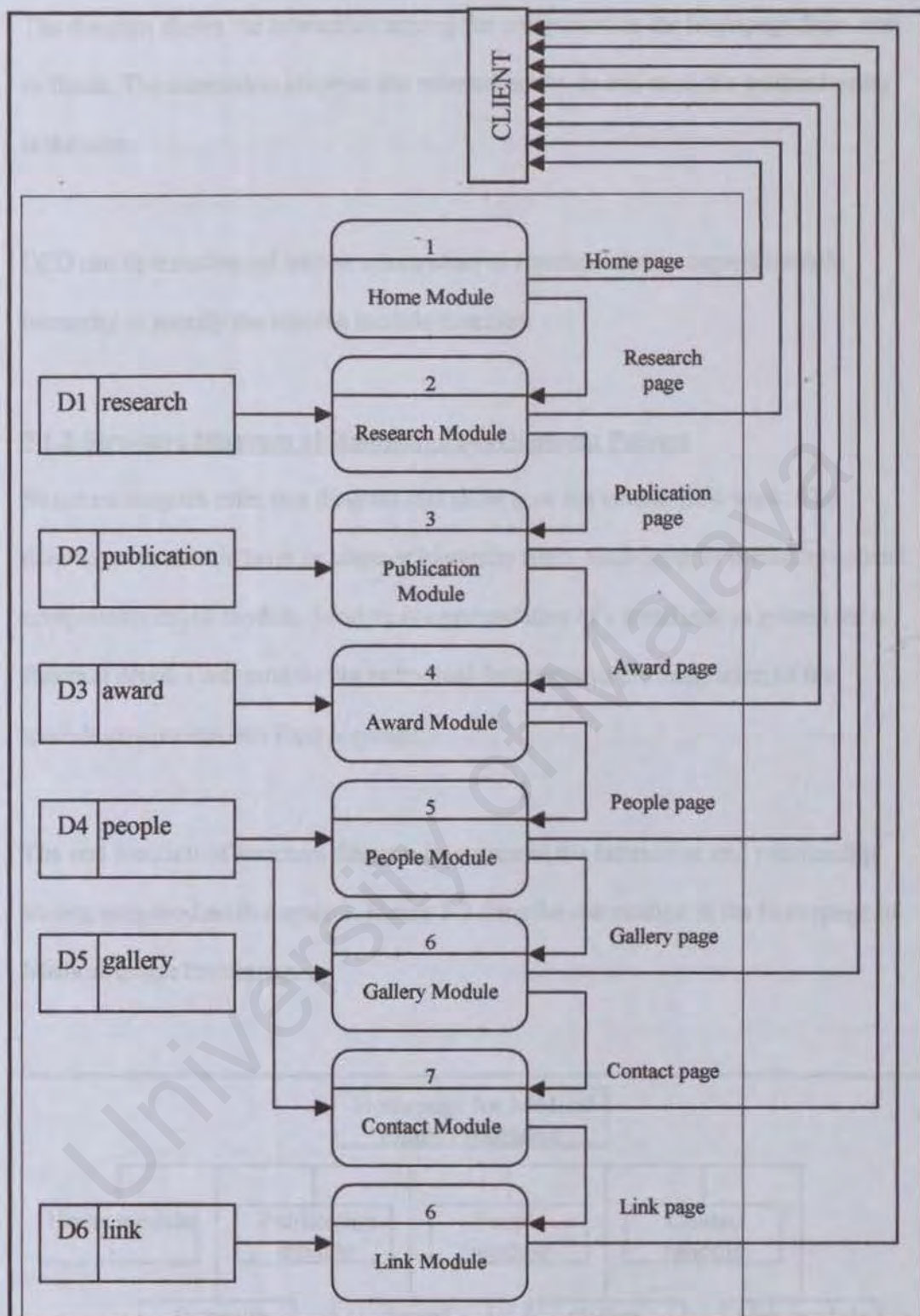


Figure 5.1: DFD for Homepage for Medical Image Processing

The diagram shows the interaction among the component in the homepage from start to finish. The interaction involves the external entity. In this case, the external entity is the user.

DFD can be transformed into structure chart to represent the homepage module hierarchy to specify the involve module function.

5.1.2 Structure Diagram of Homepage Development Process

Structure diagram refer to a diagram that show how the system flow work. The diagram presented in layer or stage or hierarchy form. Each layer or hierarchy consist components called module. Module is a preventative of a small unit in system for a function detail. Each module has individual function and the integration of the module component will form a system.

The real function of structure diagram is to present the interaction and relationship among each module in a system. Figure 5.2 describe the module in the Homepage of Medical Image Processing.

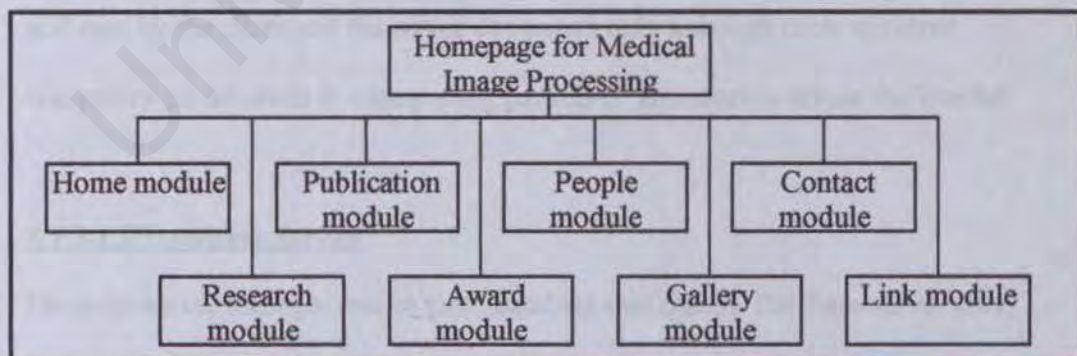


Figure 5.2: Structure Diagram and Module Component in Homepage of Medical Image Processing

5.1.3 Processing Methodology

System transaction processing can be implemented with much method. The method determination depends on the user requirement. After the processing method is specified, the processing method design can be start to develop. For this project, client-server architecture is use for the processing method.

5.1.3.1 Web Client-Server Architecture

Client-server architecture is used in LANs (Local Area Network), WANs (Wide Area Network) and the Web. Client computer request services such as database access, printing, file management and language translation. The server processes the client's requests. The computers that perform the server function must have high capability than the client computers they serve. Figure 5.3 presents the server-side scripting data flow between Web server machine and user's machine.

5.1.3.1.1 Two-Tier Client-Server Architecture

The two-tier model has only one client and one server. All communication takes place on the Internet between the client and the server. The message that are created and read by the client and the server computers only although there are other computers are involved in transporting packets of information across the Internet.

5.1.3.1.2 Database Server

Database server manages one or more database that shared. Database server also implements all the database instruction and the other service of information system. For this project, MySQL is used for the database server.

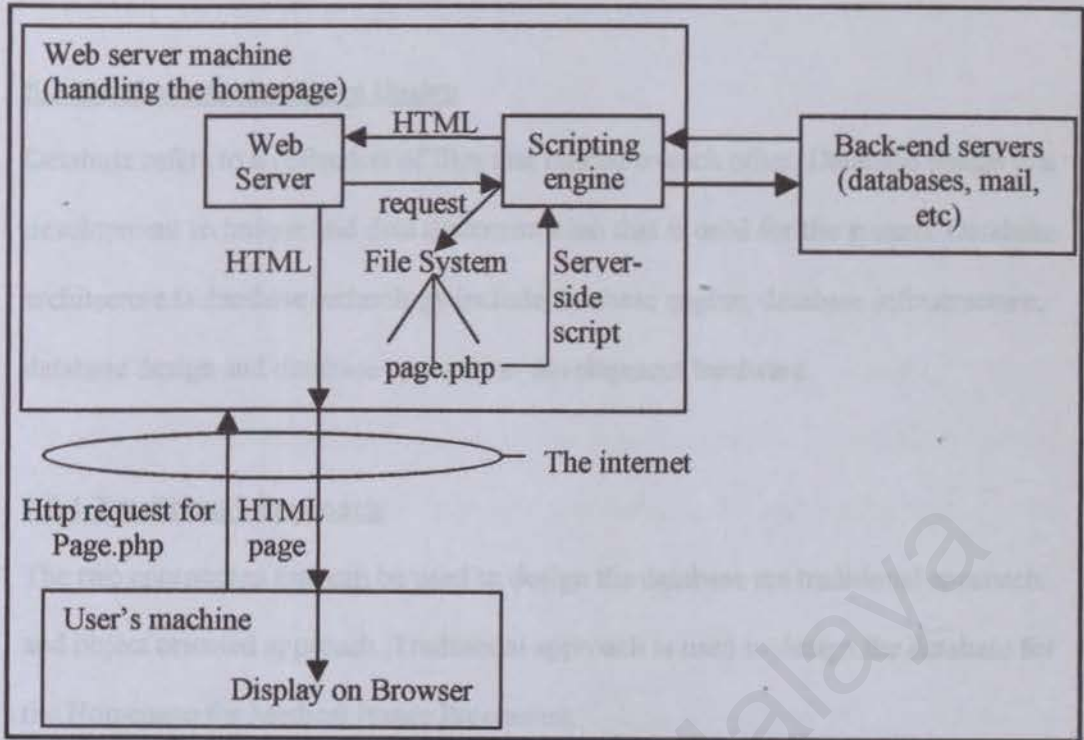


Figure 5.3: Representation of Server-side Scripting Data Flow

5.1.3.1.3 Web Server

Web server is an application that is used to manage the Internet. Web server communicates with thin and fat client where the document returned in the HTML format to client.

5.1.3.1.4 Scripting Language Selection

Homepage development architecture process defined in HTML and scripting language form. For the Homepage for Medical Image Processing, PHP (Hypertext Preprocessing) is used to build the homepage.

5.2 Database Architecture Design

Database refers to a collection of files that related to each other. Database design is a development technique and data documentation that is used for the system. Database architecture is database technology include database engine, database infrastructure, database design and database application development hardware.

5.2.1 Traditional Approach

The two approaches that can be used to design the database are traditional approach and object oriented approach. Traditional approach is used to design the database for the Homepage for Medical Image Processing.

5.2.1.1 Objective and Early Requirement of Database Design

The database must have storage, update and efficient access capability. For this project, the database must have capability to store the entire document about the project done by the research group. The document is maybe in text, video or graphic form.

The objectives of the database design are:

- i. To store the entire document about the project done by the research group.
- ii. To store the publication produced in this research area.
- iii. To store the awards won by the research group.
- iv. To store the image, movie and 3-D model file.
- v. To store the people who work in the research group profile and e-mail address.

- vi. To store the related project send by the user.

5.2.1.2 MySQL for the DBMS Choice

For this project, MySQL is chosen for database server. The reasons of using MySQL as the database server are:

- MySQL is a database management system. A database is a structured collection of data. It may be anything from a simple shopping list to a picture gallery or the vast amounts of information in a corporate network. To add, access, and process data stored in a computer database, we need a database management system such as MySQL Server. Since computers are very good at handling large amounts of data, database management plays a central role in computing, as stand-alone utilities, or as parts of other applications.
- MySQL is a relational database management system. A relational database stores data in separate tables rather than putting all the data in one big storeroom. This adds speed and flexibility. Defined relations making it possible to combine data from several tables on request link the tables.
- MySQL software is Open Source. Open Source means that it is possible for anyone to use and modify. Anybody can download the MySQL software from the Internet and use it without paying anything. Anybody so inclined can study the source code and change it to fit their needs. The MySQL software uses the GPL (GNU General Public License), <http://www.gnu.org/licenses/>, to define what we may and may not do with the software in different situations.
- The MySQL Database Server is very fast, reliable, and easy to use. If that is what you are looking for, you should give it a try. MySQL Server also has a practical set of features developed in close cooperation with users. MySQL

Server was originally developed to handle large databases much faster than existing solutions and has been successfully used in highly demanding production environments for several years. Though under constant development, MySQL Server today offers a rich and useful set of functions. Its connectivity, speed, and security make MySQL Server highly suited for accessing databases on the Internet.

- The MySQL Database Software is a client/server system that consists of a multi-threaded SQL server that supports different backends, several different client programs and libraries, administrative tools, and a wide range of programming interfaces (APIs).

5.2.1.3 Database Schema

Database creation is a process called database schema. Database schema means the physical model or the blueprint for the database. It represents the technical implementation for logic data model.

The database consist six entities, which produce six tables. The tables are Research, Publication, Award, People, Gallery and Link.

5.2.1.3.1 RESEARCH Table

Field	Type	Null	Key	Default	Extra
rid	int(10)		PRI	NULL	auto_increment
rtitle	varchar(255)				
rdescription	text				
status	varchar(50)				
rresearcher	varchar(255)				

Table 5.2: Fields in table RESEARCH

5.2.1.3.2 PUBLICATION Table

Field	Type	Null	Key	Default	Extra
pid	int(10)		PRI	NULL	auto_increment
ptitle	varchar(255)				
pauthor	varchar(255)				
pdescription	varchar(255)				

Table 5.3: Fields in table PUBLICATION

5.2.1.3.3 AWARD Table

Field	Type	Null	Key	Default	Extra
aid	int(10)		PRI	NULL	auto_increment
atitle	varchar(255)				
adescription	text				
projectTitle	varchar(255)				

Table 5.4: Fields in table AWARD

5.2.1.3.4 PEOPLE Table

Field	Type	Null	Key	Default	Extra
id	int(10)		PRI	NULL	auto_increment
peopleTitle	varchar(50)				
peopleName	varchar(50)				
peopleInfo	text				
researchArea	text				
status	varchar(50)				
picName	varchar(255)				
email	varchar(255)				

Table 5.5: Fields in Table PEOPLE

5.2.1.3.5 GALLERY Table

Field	Type	Null	Key	Default	Extra
gid	int(10)		PRI	NULL	auto_increment
imageTitle	varchar(255)				
imageDescription	text				
imageName	varchar(50)				
projectTitle	varchar(255)				

Table 5.6: Fields in Table GALLERY

5.2.1.3.6 LINK Table

Field	Type	Null	Key	Default	Extra
lid	int(10)		PRI	NULL	auto_increment
organisation	varchar(255)				
linkAdd	varchar(255)				

Table 5.7: Fields in Table LINK

5.3 Interface Design

A user interface can be defined as a collection of techniques and mechanisms to interact with something. Interface design refers to dialog specification between human (user) and computer. The dialog here means the icon for user to click if they want to go to the other Web page. Figure 5.4 shows the example of the Web interface design for the Homepage of Medical Image Processing.

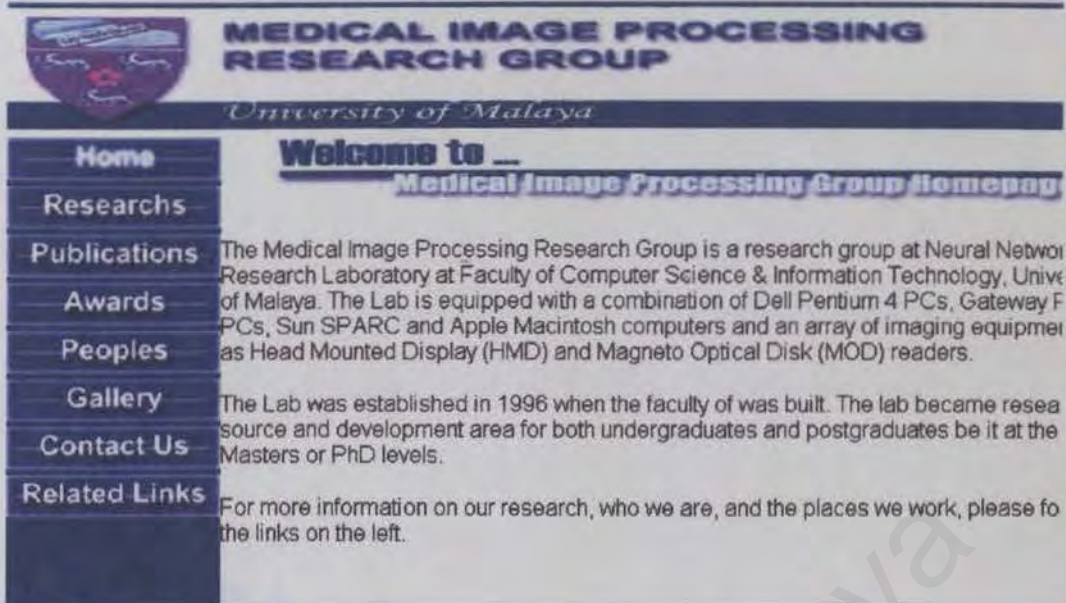


Figure 5.4: The Home Page Interface Design

Web page interface design can be create by using the WYSIWYG tool or text editor where we need to create the tag by hand. Figure 5.4 is the interface design creates as a prototype interface. It can't run the server-side task because it is a static HTML page. To include the server-side script, PHP is used to create the server-side scripting language.

5.4 Summary

This chapter contain the description about the integration of the entire homepage module that has the specific function that must be implemented by the homepage. It's involved interface and screen design, information flow and the involve modules in this project.

The development and implementation is a phase where the system is developed and prepared to operate. Development phase is a process of developing, installing, and testing the full system or systems. Implementation is a process of system delivery or release. The activities involved in this stage are network development and testing, database development and testing, software package installation and testing, support

CHAPTER 6

SYSTEM IMPLEMENTATION AND DEVELOPMENT

6.1. Introduction

Before start the system or implementing the data needed the developer to be consider. There are software packages PHP and MySQL need to be downloaded and set up.

PHP is a server-side scripting language. It is a "glue" for Web server that will allow it to do everything you need. Also PHP pages when released, you'll know. With PHP installed, Web server will be able to read a new kind of file which is called a PHP script. But not by them, like our own programs from a database and server it will a Web page.

The development and implementation is a stage where the system is developed and prepare to operate. System development is a process of developing, installing, and testing the built system components. Implementation is a process of system delivery to operate. The activities involved in this stage are network development and testing, database development and testing, software package installation and testing, program writing and testing and also documentation preparation.

The main activity in the development stage is programming. Program writing is the very important activity because it is the activity where the theoretical work is turned into practice. In implementation stage, the most important thing is to make sure the built system can be operated or not.

6.1. Installation

Before start the homepage programming, the tools needed for the job have to be installed. The two software packages: PHP and MySQL need to be downloaded and set up.

PHP is a server-side scripting language. It is a "plug-in" for Web server that will allow it to do more than just send plain Web pages when browsers request them. With PHP installed, Web server will be able to read a new kind of file which is called a PHP script that can do things like retrieve information from a database and insert it into a Web page

before sending it to the browser that requested it. PHP is completely free to download and use.

To retrieve information from a database, a database is needed. For this purpose, MySQL is needed. MySQL is a relational database management system (RDBMS). It is a software package that is very good at organizing and managing large amounts of information. MySQL also makes that information really easy to get at using server-side scripting languages like PHP. MySQL is free for non-commercial use on most Unix-based platforms, like Linux.

6.2 Database Development

PHP is a server-side scripting language that lets programmer to insert instructions into Web pages that Web server software, for this project Apache Web Server is used, will execute before sending those pages to a browser that requests them. A database server in this project, MySQL is a program that can store large amounts of information in an organized format that is easily accessible from scripting languages like PHP. For this project, PHP code is created to look in the database for a list of information about the research done in the medical image processing area that like to appear on the Web site.

In this project, the information would be stored entirely in the database. There are two advantages of this: First, instead of having to write an HTML file for each of the information, a single PHP file could be created to fetch any information out of the database and display it and second, to add a information to Web site would just be a matter of adding the information to the database. The PHP code automatically displaying

the new information along with the rest when it fetched the list of information from the database.

6.2.1 Structured Query Language

The set of commands will be using for the project database development using MySQL is part of a standard called Structured Query Language, or SQL. Commands in SQL are also called queries.

6.2.2 Creating A Database

The command for creating the project database:

```
mysql> CREATE DATABASE project;
```

6.2.3 Creating Database Tables

The basic form of the command for creating a table is as follows:

```
mysql> CREATE TABLE <table name> (  
-> <column 1 name> <col. 1 type> <col. 1 details>,  
-> <column 2 name> <col. 2 type> <col. 2 details>,  
-> ...  
-> );
```


6.2.3.1 Creating research Table

For **research** table, it had five columns: **rid** (a number), **rtitle** (the text of the research title), **rresearcher** (the person name who involved in a project), **status** (the research status, whether it is Current or Previous), and **researchDescription** (the description about the research). The command to create this table looks like this:

```
mysql> CREATE TABLE research (
```

```
-> rid INT(10) NOT NULL AUTO_INCREMENT PRIMARY KEY,
```

```
-> rtitle VARCHAR(255) NOT NULL,
```

```
-> rresearcher VARCHAR(255) NOT NULL,
```

```
-> status VARCHAR(50) NOT NULL,
```

```
-> rdescription TEXT NOT NULL
```

```
-> );
```

6.2.3.2 Creating publication Table

For **publication** table, it had four columns: **pid** (a number), **ptitle** (the text of the publication title), **pauthor** (the person name who involved in a publication) and **pdescription** (the description about the publication). The command to create this table looks like this:

```
mysql> CREATE TABLE publication (
```

```
-> pid INT(10) NOT NULL AUTO_INCREMENT PRIMARY KEY,
```

```
-> ptitle VARCHAR(255) NOT NULL,
```

```
-> pauthor VARCHAR(255) NOT NULL,
```

-> **pdescription TEXT NOT NULL**

->);

6.2.3.3 Creating award Table

For **award** table, it had four columns: **aid** (a number), **atitle** (the text of the award title), **adescription** (the description about the award) and **projectTitle** (the project title). The command to create this table looks like this:

mysql> CREATE TABLE award (

-> **aid INT(10) NOT NULL AUTO_INCREMENT PRIMARY KEY,**

-> **atitle VARCHAR(255) NOT NULL,**

-> **projectTitle VARCHAR(255) NOT NULL,**

-> **rdescription TEXT NOT NULL**

->);

6.2.3.4 Creating people Table

For **people** table, it had eight columns: **id** (a number), **peopleTitle** (the title of group member), **peopleName** (the name of group member), **peopleInfo** (the information about the group member), **researchArea** (the areas of research a group member involved), **picName** (the picture filename of the group member), **status** (the status of the group member (Supervisor or Research Assistant), and **email** (group member e-mail address).

The command to create this table looks like this:


```
mysql> CREATE TABLE people (
```

```
-> id INT(10) NOT NULL AUTO_INCREMENT PRIMARY KEY,
```

```
-> peopleTitle VARCHAR(255) NOT NULL,
```

```
-> peopleName VARCHAR(255) NOT NULL,
```

```
-> peopleInfo TEXT NOT NULL,
```

```
-> researchArea VARCHAR(255) NOT NULL,
```

```
-> picName VARCHAR(50),
```

```
-> status VARCHAR(50),
```

```
-> email VARCHAR(50),
```

```
-> );
```

6.2.3.5 Creating gallery Table

For **gallery** table, it had five columns: **gid** (a number), **imageTitle** (the image title), **imageDescription** (the image description), **imageName** (the image file name), and **projectTitle** (the project title). The command to create this table looks like this:

```
mysql> CREATE TABLE gallery (
```

```
-> gid INT(10) NOT NULL AUTO_INCREMENT PRIMARY KEY,
```

```
-> imageTitle VARCHAR(255) NOT NULL,
```

```
-> imageDescription TEXT NOT NULL,
```

```
-> imageName VARCHAR(50) NOT NULL,
```

```
-> projectTitle VARCHAR(255) NOT NULL
```

```
-> );
```


6.2.3.6 Creating link Table

For **link** table, it had three columns: **lid** (a number), **organization** (the organization related to research group), and **linkAdd** (the related link address). The command to create this table looks like this:

```
mysql> CREATE TABLE link (  
-> rid INT(10) NOT NULL AUTO_INCREMENT PRIMARY KEY,  
-> organization VARCHAR(255) NOT NULL,  
-> linkAdd VARCHAR(255) NOT NULL  
-> );
```

6.2.4 Inserting Data into a Table

The database is created and all the tables are built. The command for inserting data into the database is called **INSERT**. There basic forms for this command is as follow:

```
mysql> INSERT INTO <table name>  
-> (columnName1, columnName2, ...)  
-> VALUES (value1, value2, ...);
```

6.3 Web Programming with PHP

PHP is a server-side scripting language. A server-side scripting language is similar to JavaScript in many ways, as they both allow embedding scripts into the HTML of a Web page. In executing, such scripts allow to control what will actually appear in the browser window in some way more flexible that what is possible using straight HTML.

6.4 Publishing MySQL Data on the Web

Take information stored in a database and display it on a Web page. To do these two tools is needed: the PHP scripting language, and the MySQL database engine.

The whole idea of a database-driven Web site is to allow the content of the site to reside in a database, and for that content to be dynamically pulled from the database to create Web pages featuring it for people using a regular Web browser to view. So on one end of the system is a visitor as the end user to the site using a Web browser, expecting to view a standard HTML Web page. On the other end the content of the site sitting in one or more tables in a MySQL database that only understands how to respond to SQL queries.

The PHP scripting language is the go-between that speaks both languages. Using PHP, the presentation aspects of the site could be written as templates in regular HTML.

Where the content belongs in those templates, some PHP code is used to connect to the MySQL database and using SQL queries just like those used to create a table, retrieve and display some content in its place.

This is what will happen when someone visits a page on the database-driven Web site:

- The visitor's Web browser asks for the Web page using a standard URL.
- The Web server software, for this project, Apache Web Server recognizes that the requested file is a PHP script, and so interprets it using its PHP plug-in before responding to the page request.

- Some PHP commands connect to the MySQL database and request the content that belongs in the Web page.
- The MySQL database responds by sending the requested content to the PHP script.
- The PHP script stores the content into one or more PHP variables, then uses the **echo** function to output it as part of the Web page.

The PHP plug-in finishes up by handing a copy of the HTML it has created to the Web server. The Web server sends the HTML to the Web browser as it would a plain HTML file, except instead of coming directly from an HTML file, the page is the output provided by the PHP plug-in.

6.4.1 Connecting to MySQL with PHP

Before getting the content out of the MySQL database for inclusion in the Web page, first to do is establish a connection to MySQL. PHP has no need of any special program, however; support for connecting to MySQL is built right into the language. The following PHP function call establishes the connection:

```
$dbnx = mysql_connect($hostname, $user, $password);
```

Where **\$hostname** is the IP address or hostname of the computer on which the MySQL server software is running, and **\$user** and **\$password** are user name and password

needed to connect to the MySQL server. The value returned by **mysql_connect** is stored in a variable named **\$dbcnx**.

Since the MySQL server is a completely separate piece of software, consider the possibility that the server is unavailable, or inaccessible due to a network outage, or because the username and password combination provided is not accepted by the server. In such cases, the **mysql_connect** function doesn't return a connection identifier. Instead, it returns false. This allows react to such failures using an if statement:

```
$dbcnx = @mysql_connect($hostname, $user, $password);  
if (!$dbcnx) {  
    echo( "<P>Unable to connect to the "  
        "database server at this time.</P>" );  
    exit();  
}
```

The exclamation point is the PHP negation operator, which basically flips a false value to true, or a true value to false. Thus, if the connection fails and **mysql_connect** returns false, **!\$dbcnx** will evaluate to true, and cause the statements in **if** statement to be executed. Alternatively, if a connection was made, the connection identifier stored in **\$dbcnx** will evaluate to true, so **!\$dbcnx** will evaluate to false, and the statements in the **if** statement will not be executed.

The **exit** function, takes no parameters to encountered. All this function does is make PHP to stop reading the page at this point. This is a good response to a failed database connection, since in most cases the page will be unable to display any useful information without that connection.

The next step once a connection is established is to select the database to work with.

Selecting that database in PHP is just a matter of another function call:

```
mysql_select_db($database, $dbcnx);
```

The **\$dbcnx** variable containing the database connection identifier used to tell the function what database connection to use. This parameter is actually optional. When it is omitted, the function will automatically use the link identifier for the last connection opened. This function returns true when successful and false if an error occurs. An if statement is used to handle errors:

```
if ( ! @mysql_select_db($database) ) {  
    echo( "<P>Unable to locate the project " .  
        "database at this time.</P>" );  
    exit();  
}
```

With a connection established and a database selected, it is ready now to begin using the data stored in the database.

6.4.2 Performing SQL Queries with PHP

In PHP, the **mysql_query** function allows to type SQL queries and view the results of those queries immediately.

mysql_query(<query>, <connection id>);

Where <query> is a string containing the SQL command to be executed. As with **mysql_select_db**, the connection identifier parameter is optional.

What this function returns depends on the type of query being sent. For most SQL commands, **mysql_query** function returns either true or false to indicate success or failure respectively.

6.4.2.1 Handling SELECT Result Sets

For most SQL queries, the **mysql_query** function returns either true to indicate success or false to indicate failure. **SELECT** queries are used to view stored data in the database. In addition to indicating whether the query succeeded or failed, PHP must also receive the results of the query. As a result, when processing a **SELECT** query, **mysql_query** returns a number that identifies a result set, containing a list of all the rows returned from the query. False is still returned if the query fails for whatever reason.


```

$result = mysql_query("SELECT <column> FROM <table>");
if (!$result) {
    echo("<P>Error performing query: " .
        mysql_error() . "</P>");
    exit();
}

```

Assuming there is no error was encountered in processing the query, the above code will place a result set containing the data stored in the database table into the variable **\$result**. Since there is no practical limit on the number of data in the database, that result set can be big.

The **while** loop is a useful control structure for dealing with large amounts of data. Here is an outline of the code to process the rows in a result set one at a time:

```

while ( $row = mysql_fetch_array($result) ) {
    // process the row...
}

```

The **mysql_fetch_array** function accepts a result set as a parameter stored in the **\$result** variable in this case, and returns the next row in the result set as an array. When there are no more rows in the result set, **mysql_fetch_array** instead returns false.

The statement assigns a value to the **\$row** variable, but at the same time the whole statement itself takes on that same value. Since **while** loops keep looping until their condition evaluates to false, the loop will occur as many times as there are rows in the result set, with **\$row** taking on the value of the next row each time through the loop. All that is left is to figure out how to get the values out of the **\$row** variable each time through the loop.

Rows of a result set are represented as arrays. In the case of the database row, the compartments are named after the table columns in our result set. **\$row** is a row in the result set, then **\$row["<column>"]** is the value in the <column> of that row. So here is what **while** loop look likes to print all the data in the **project** database:

```
while ( $row = mysql_fetch_array($result) ) {  
    echo("<P>" . $row["<column>"] . "</P>");  
}
```

6.6 Summary

Open source has brought more than Linux to the computing world. MySQL and the PHP scripting language, two open source products that together provide everything needed to launch a database-driven Web site with all the capabilities and administrative benefits that stem from it.

After finishing all the modules programming, programming testing process must be implement. Programming testing is a very important activity. This activity makes sure whether the program is free from error or not. Testing activity have four several stages. Those stages of testing are unit testing, integration testing, system testing, performance testing, acceptance testing, and maintenance testing. The relationship among these activity is shown in Figure 7.1.

CHAPTER 7

SYSTEM TESTING

Each component tested prior to developing and testing the system. In testing the system components, it is recommended that analysis of the results of testing report of the test model by multi-component model should use a test plan as a formal testing plan. After creating a detailed test to test a series of the test plan can be used to report the quality work and maintain to work as needed. A specially model for making very detailed comparison to work on multiple model.

After finishing all the involve programming, programming testing process must be implement. Programming testing is a very important activity. This activity makes sure whether the program is free from error or not. Testing usually involves several stages. These stages of testing are: unit testing, integration testing, function testing, performance testing, acceptance testing and installation testing. The relationship among these testing steps shown in FIGURE 7.1.

7.1. Test Organization

Each component model needs to develop and maintain it's own suite of testing for that given component. It is recommended that analysis of the kinds of testing required for each model by each component models done and written down in a formal testing-plan. Also creating automated tests to run a suite of standard tests can be useful to ensure the models work and continue to work as needed. This is especially useful for making sure models continue to work on multiple platforms.

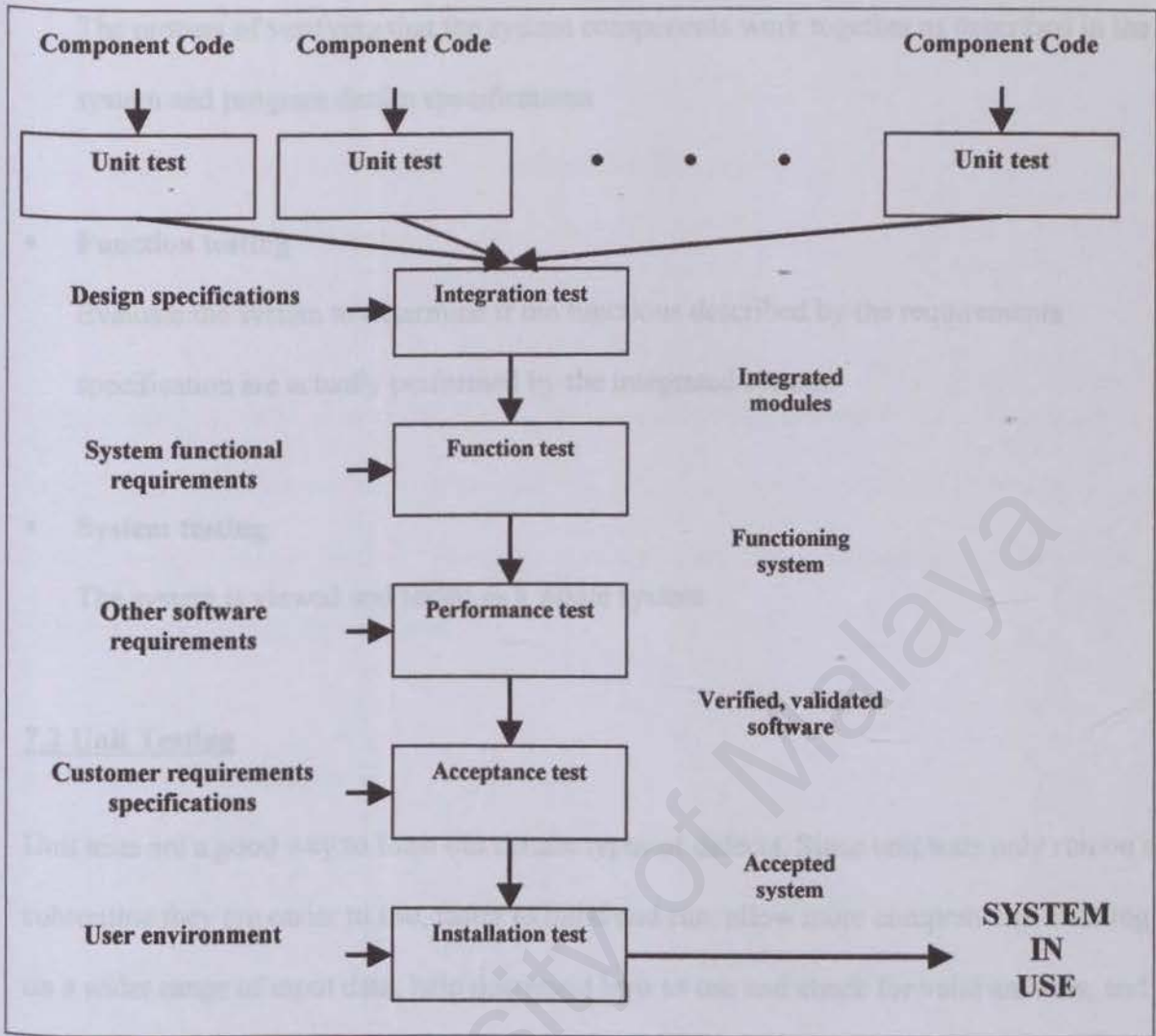


FIGURE 7.1: Testing steps

7.1.1. Designing Good Tests

In order to design a comprehensive testing plan, the following types of tests is taken.

- **Unit testing**

Each program component is tested on its own, isolated from the other components in the system.

- **Integration testing**

The process of verifying that the system components work together as described in the system and program design specifications

- **Function testing**

Evaluate the system to determine if the functions described by the requirements specification are actually performed by the integrated system.

- **System testing**

The system is viewed and tested as a whole system.

7.2 Unit Testing

Unit tests are a good way to flush out certain types of defects. Since unit tests only run on one subroutine they are easier to use, faster to build and run, allow more comprehensive testing on a wider range of input data, help document how to use and check for valid answers, and allows faster testing of individual pieces. By building and maintaining unit-tests the same tests can be run and used by other developers as part of a more comprehensive testing package. Without maintaining unit tests developers often do less testing than required since system tests are so much harder to do or have to hack together unit tests for each change. By maintaining unit-tests, it allows others to leverage off previous work and provide a format to quickly do extensive checking.

Good unit tests will do the following:

1. Applicable requirements are checked.
2. Exercise every line of code.
3. Check that the full range of possible input data works.
4. Check for bad input data.

By analyzing the code to be tested different test cases can be designed to ensure that all logical statements are exercised in the unit test. Data input can be designed to test the possible output on the interface. These types of tests may also be applied for more complex functional and system tests as well.

7.3. Integration Testing

When the individual components are working correctly and meet the objectives, combine the components into a working system. The integration is planned and coordinated so that when a failure occurs, the cause of the failure is identified. The order in which component are tested affects the choice of test cases and tools. For large systems, some components may be in the coding phase, others may be in the unit-testing phase, and still other collections of components may be tested together. The system is viewed as a hierarchy of components, where each component belongs to a layer of the design.

7.3.1. Big-bang Integration

For this project, big-bang integration is used to implement the integration testing. Big-bang approach usually used for small systems and it is not practical for big system. All components

are tested individually, and finally mix them together as the final system and see if it works the first time. FIGURE 7.2 shows how it works on this homepage project.

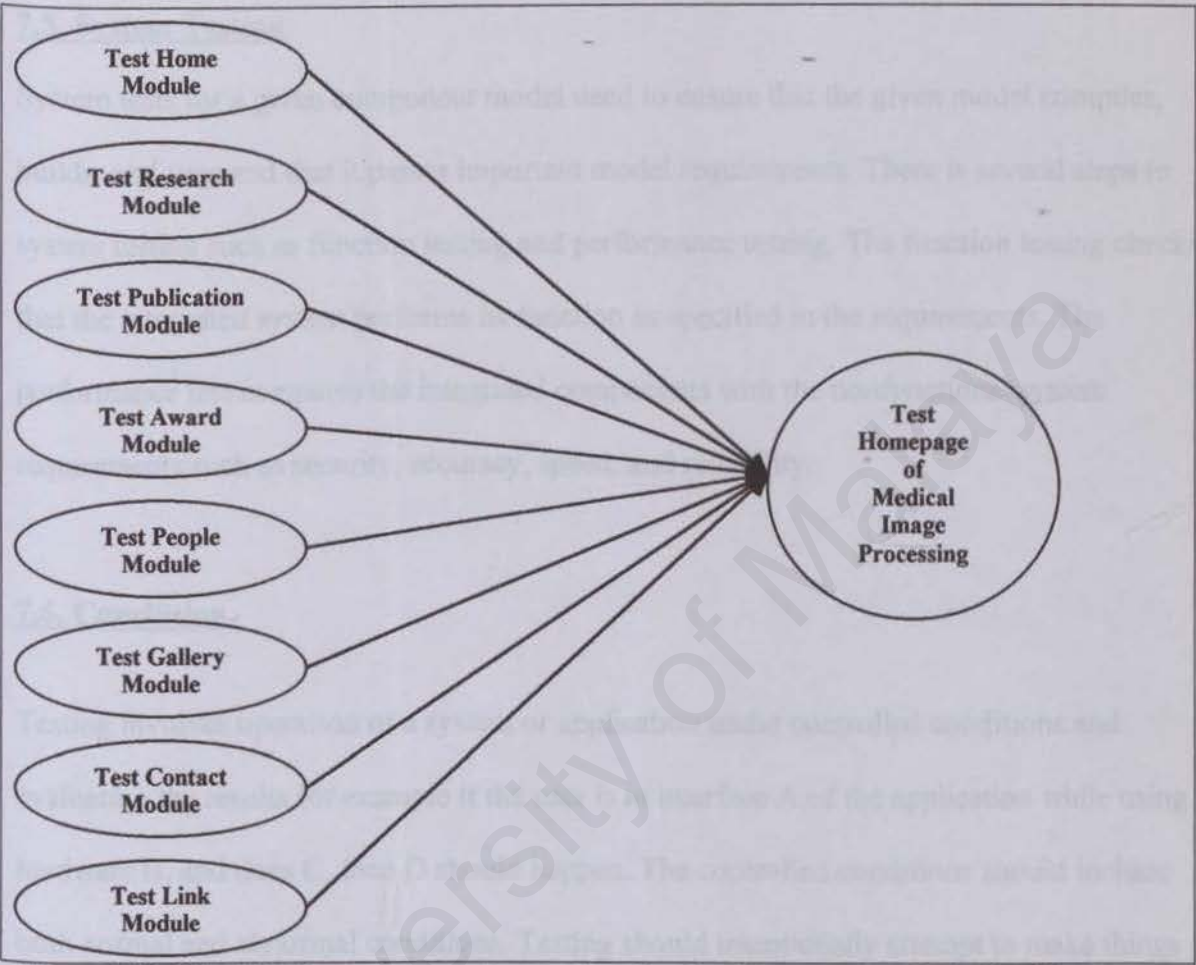


Figure 7.2: The Big Bang integration testing for the Homepage of Medical Image Processing.

7.4. Function Testing

The function testing begins with a set of components that were tested individually and then together. The function testing checks that the integrated component of system performs its functions as specified in the requirements. For this homepage, the function test verifies that

the homepage can connect to the database server and access the data from MySQL database correctly.

7.5. System Testing

System tests for a given component model need to ensure that the given model compiles, builds, and runs and that it passes important model requirements. There is several steps in system testing such as function testing and performance testing. The function testing checks that the integrated system performs its function as specified in the requirements. The performance test compares the integrated components with the nonfunctional system requirements such as security, accuracy, speed, and reliability.

7.6. Conclusion

Testing involves operation of a system or application under controlled conditions and evaluating the results for example if the user is in interface A of the application while using hardware B, and does C, then D should happen. The controlled conditions should include both normal and abnormal conditions. Testing should intentionally attempt to make things go wrong to determine if things happen when they shouldn't or things don't happen when they should. It is oriented to detection. Organizations vary considerably in how they assign responsibility for quality assurance and testing. Sometimes they're the combined responsibility of one group or individual. Also common are project teams that include a mix of testers and developers who work closely together, with overall quality assurance processes monitored by project managers. It will depend on what best fits an organization's size and business structure.

8.1 Problems Encountered And Solution

A lot of experts had been said up by some of technologies and programming concepts before starting to develop *Homepage for Medical Image Processing*. The basic knowledge needed as a foundation in building an application of this nature involves various in fields such as technical, information systems and others.

CHAPTER 8

Throughout the development of *Homepage for Medical Image Processing*, a few problems were encountered. However, most of them were solved immediately. Some of the problems encountered were:

SYSTEM EVALUATION AND CONCLUSION

8.1.1 Problems In Technical Skills

It was difficult to select the most appropriate programming language and tools for the development. To gain the benefit of web based programming and libraries the more appropriate approach to develop *Homepage for Medical Image Processing* in Java script and JavaScript for the web-based programming language was used and as a reference book of web server. The studies and research activities facilitating Internet, building working steps, related resources and reference books.

8.1.2 Lack Of Knowledge In The Language

Due to time constraints the learning of a PHP language and developing process was done in parallel. Without a strong base of the language, a lot of time taken to solve the

8.1 Problems Encountered And Solutions

A lot of systems analyses need to be done on technologies and programming concepts before starting to develop Homepage for Medical Image Processing. The basic knowledge needed as a foundation in building an application of this nature involves studies in fields such as Internet, Information Systems and others.

Throughout the development of Homepage for Medical Image Processing, a few problems were encountered. However, most of them were resolved eventually. Some of the problem encountered was:

8.1.1 Problems In Tooling & Solution

It was difficult to select the most appropriate programming language and tools for the development. To gain more insight of web based programming and identifies the most appropriate approach to develop Homepage for Medical Image Processing, in depth studies and research on the web based programming language was carried out in earlier stage of development. The studies and research activities including Internet surfing, reading topic, related magazine and reference books.

8.1.2 Lack Of Knowledge In The Language

Due to time constraints the learning the PHP language and developing process was done in parallel. Without a strong base of the language, a lot of time taken to solve the

problems encountered that occurred during the development. This happened because the concept of programming language that is new.

8.1.3 Slow Response Time

Some of the modules need to be able to response on minimum amount of time. If all the information input of each user is stored in database, the response time will be very slow.

In order to speed up response time, each of the information to be display on the page was stored in a separate table rather than having to store all information of all data into one table. It will be much easier this way.

8.1.4 Difficulty In The Installation And Configuration Of Software Package

There were some difficulties in installation of Apache Web Server, MySQL Database Server and PHP scripting language on Linux system. The RPM package already has this three software package, but the configuration is not well because the PHP cannot support the MySQL database server.

To solve this problem, this three software was uninstalled from the RPM package and installed again manually where this packages binaries downloaded from the Internet since it was free to download. Because of the unfamiliar to the Linux system, it is hard to install and install the software again.

8.2 System Strength

8.2.1 User Friendly

In overall, Homepage for Medical Image Processing could be evaluated as a simple web page since it just display the information from the database. Homepage for Medical Image Processing provides simple, user friendly and graphical based interface for user to deal with it.

8.2.2 Transparency

The system is transparent to the users, as they do not need to know where the database resides, how the systems is structured.

8.3 System Weakness

There are some limitations due to time constraints, facilities, limitations and constraints of the programming language itself including:

8.3.1 Security

There is no any protocol or Internet security involved such as SSL (Secure Socket Layer) employed.

8.4 Future Enhancements

Some of the future enhancements that should be considered to be included: -

8.4.1 Content Management

Content management is needed so it is easy for administrator to manage the tables in the database. If the content management exist, the administrator do not need to log to MySQL monitor to insert, delete and update the data since it require administrator to doing the SQL query to do such that task.

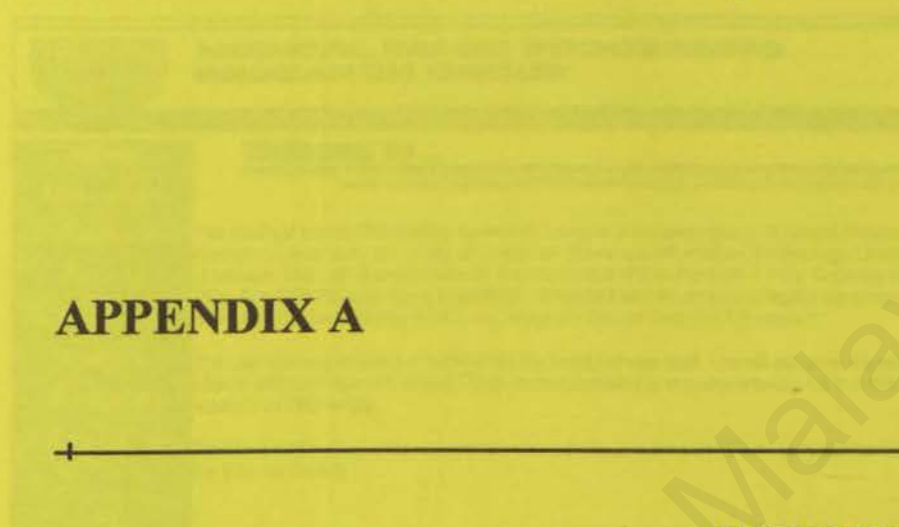
8.5. ACHIEVEMENTS OF OBJECTIVES

The primary goal of this project was to display the data about the Medical Image Processing Group. Since Homepage of Medical Image Processing is database-driven web development, all the data about the research group need to be input in the database.

8.6 Summary

Overall, the requirements of this project as determined during the system analysis phase were done eagerly. This homepage uses the database management system to store the data. Database is setup to store all the records of the research group. The aim of this project is to develop website for the use of displaying the data from the database.

A.1. Home Page



APPENDIX A

SCREEN SHOTS

Figure A.1: Home Page Screen Shot

A.2. Research Page

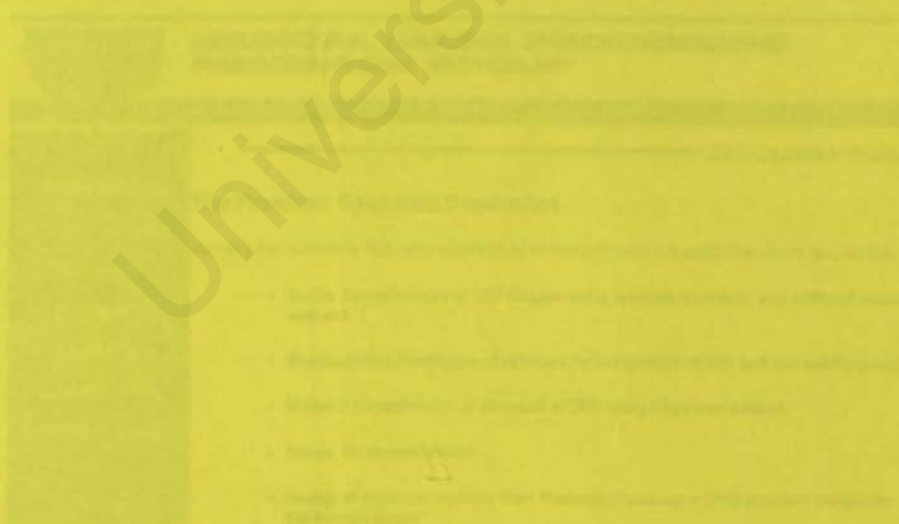


Figure A.2: Research Page Screen Shot

Appendix A: Screen Shots

A.1. Home Page

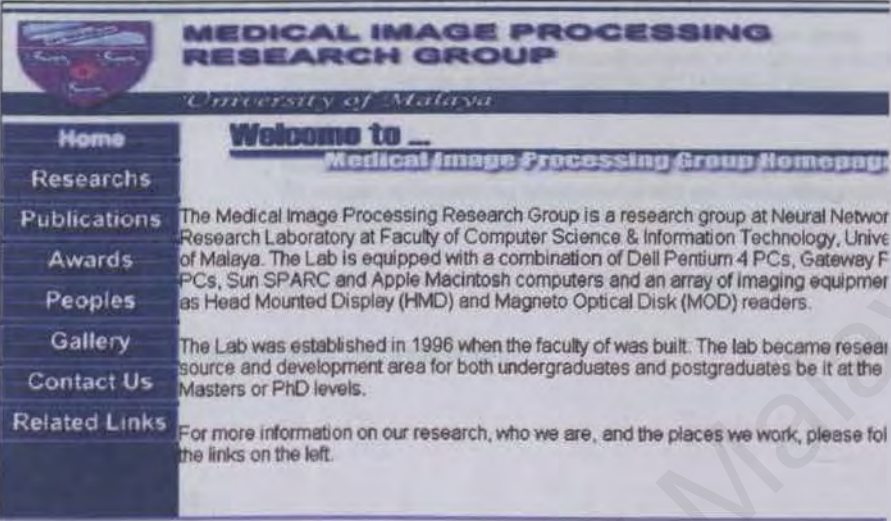


Figure A.1: Home Page Screen Shot

A.2. Research Page

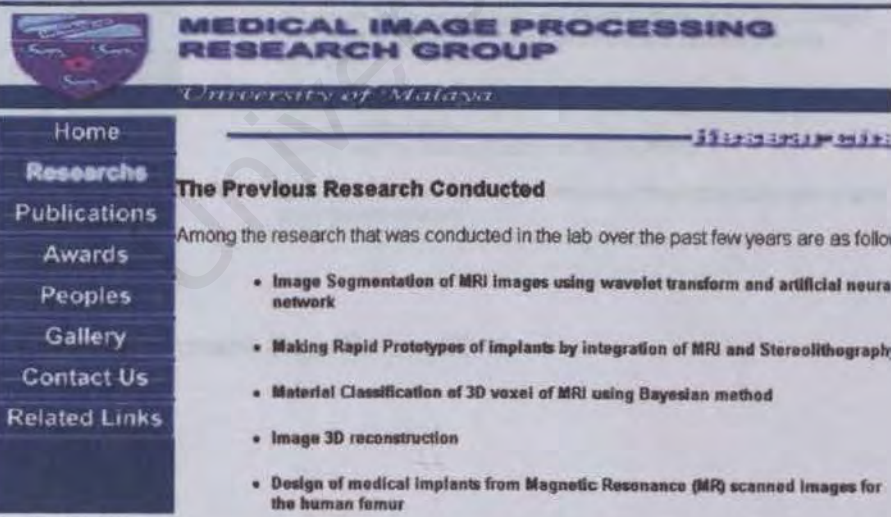


Figure A.2: Research Page Screen Shot

3. Publication Page

The screenshot shows the 'Publications' page of the Medical Image Processing Research Group at the University of Malaya. The page has a dark blue header with the group's name and logo. A left sidebar contains navigation links: Home, Researchs, Publications (highlighted), Awards, Peoples, Gallery, Contact Us, and Related Links. The main content area lists three publications:

- Numerous papers have been published be it in the computer science journal or at conference. Among others they are :
- Woo Chew Seng et al., **Image Segmentation of MRI images using wavelet transform and artificial neural network**, proceedings of the 7th JSPS-VCC Seminar in Integrated Engineering, University of Malaya, 1998, pp.32-37.
- Somasundram, N. Selvanathan, Woo Chew Seng, **Making Rapid Prototypes of implants by integration of MRI and Stereolithography** IMIT conference, 27-29 Aug.99, PWTC, Kuala Lumpur, Malaysia
- Mangalam S, N. Selvanatan, Sapiyan Baba, **Material Classification of**

Figure A.3: Publications Screen Shot

4. Award Page

The screenshot shows the 'Awards' page of the Medical Image Processing Research Group at the University of Malaya. The page has a dark blue header with the group's name and logo. A left sidebar contains navigation links: Home, Researchs, Publications, Awards (highlighted), Peoples, Gallery, Contact Us, and Related Links. The main content area lists three awards:

- Among the awards won for the research work
- **Anugerah Techsource Systems (Best IT Project)** for Making Rapid Prototypes of Implants by Integration of MRI and Stereolithography IPTA 2001
- **Silver Medal** for Making Rapid Prototypes of Implant by Integration of MRI and Stereolithography Science and Technology Exhibition 2001 in PWTC
- **Gold Medal** for Making Rapid Portotypes of Implant by Integration of MRI and Stereolithography IPPP IRPA Exhibition 2001, University of Malaya

Figure A.4: Award Page Screen Shot

5. People Page

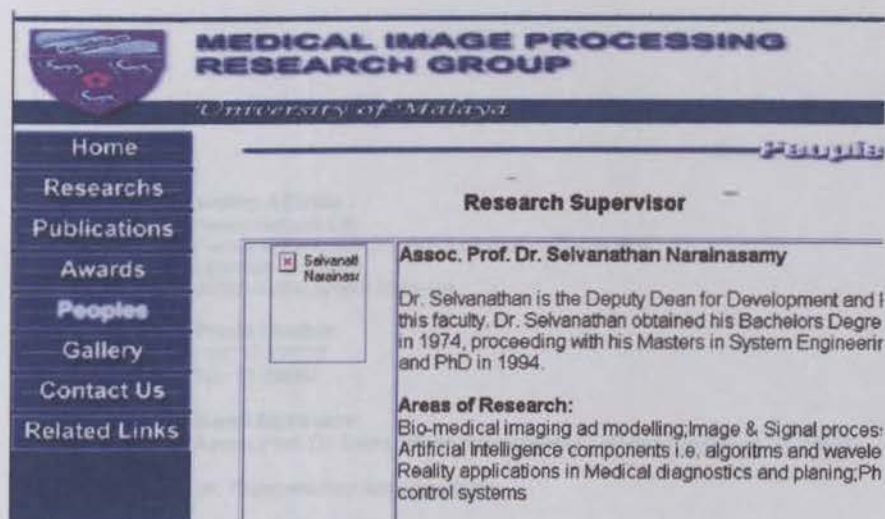


Figure A.5: People Page Screen Shot

6. Gallery Page

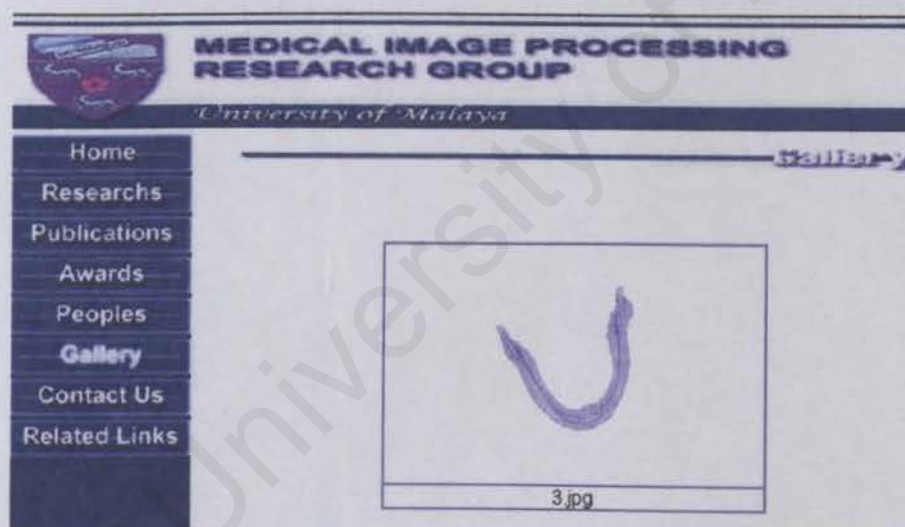
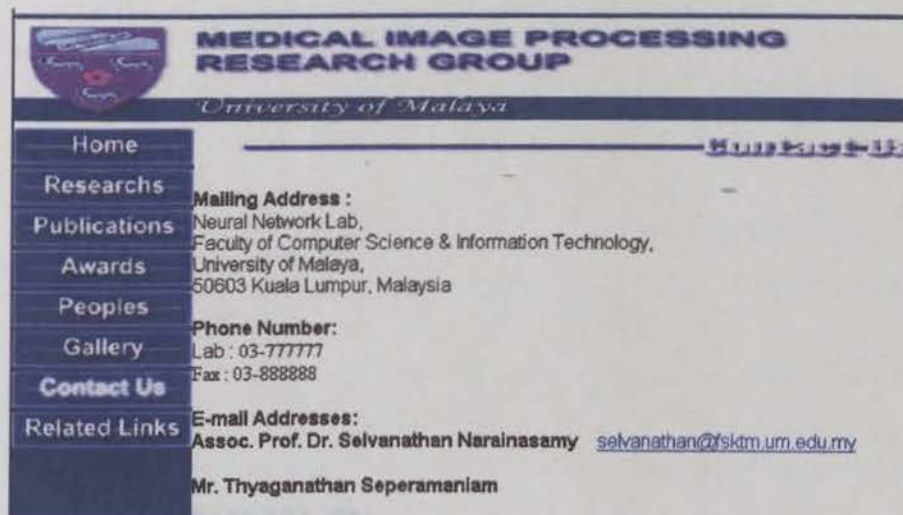


Figure A.6: Gallery Page Screen Shot

7. Contact Page



The screenshot shows the contact page of the Medical Image Processing Research Group. The header includes the group's name and the University of Malaya logo. A left sidebar contains navigation links: Home, Researchs, Publications, Awards, Peoples, Gallery, Contact Us, and Related Links. The main content area provides contact details: Mailing Address (Neural Network Lab, Faculty of Computer Science & Information Technology, University of Malaya, 50603 Kuala Lumpur, Malaysia), Phone Number (Lab: 03-777777, Fax: 03-888888), and E-mail Addresses (Assoc. Prof. Dr. Selvanathan Narainasamy at selvanathan@fsktm.um.edu.my and Mr. Thyaganathan Seperamaniam).

MEDICAL IMAGE PROCESSING RESEARCH GROUP
University of Malaya

Home | **Contact Us**

Researchs
Publications
Awards
Peoples
Gallery
Contact Us
Related Links

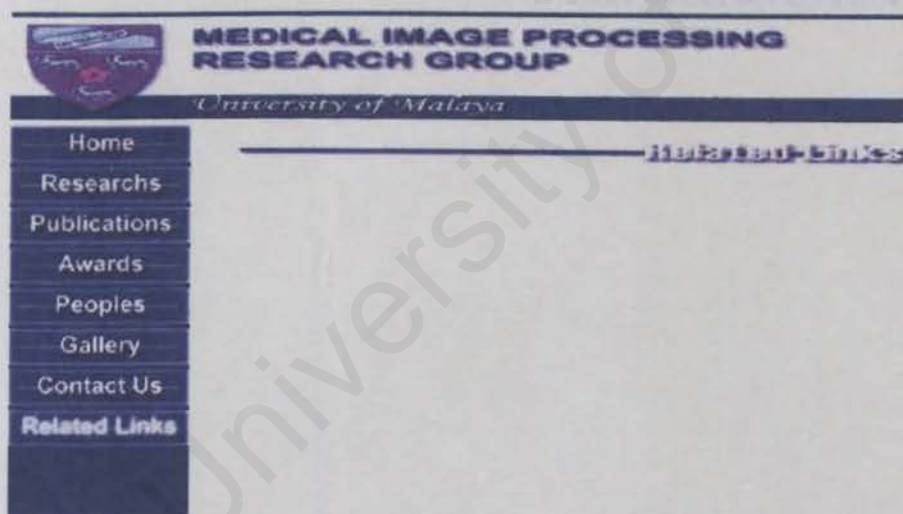
Mailing Address :
Neural Network Lab,
Faculty of Computer Science & Information Technology,
University of Malaya,
50603 Kuala Lumpur, Malaysia

Phone Number:
Lab : 03-777777
Fax : 03-888888

E-mail Addresses:
Assoc. Prof. Dr. Selvanathan Narainasamy selvanathan@fsktm.um.edu.my
Mr. Thyaganathan Seperamaniam

Figure A.7: Contact Page Screen Shot

8. Link Page



The screenshot shows the link page of the Medical Image Processing Research Group. The header is identical to the contact page. The left sidebar navigation menu is the same, but the 'Contact Us' link is not highlighted. The main content area is currently empty.

MEDICAL IMAGE PROCESSING RESEARCH GROUP
University of Malaya

Home | **Related Links**

Researchs
Publications
Awards
Peoples
Gallery
Contact Us
Related Links

Figure A.8: Link Page Screen Shot

APPENDIX B

PROGRAMMING CODE

Appendix B: Programming Code

```
<!--home.htm-->

<HTML><HEAD><TITLE>Medical Image Processing Research Group :
Home</TITLE></HEAD>
<BODY bgColor=#ffffff leftMargin=0 topMargin=0 MARGINHEIGHT="0"
MARGINWIDTH="0">

<TABLE height=100% cellSpacing=0 cellPadding=0 border=0 width="100%">
<TBODY>
<TR vAlign=top>
<TD colspan=2 height=100> <IMG height=100 src="image/topheader.jpg"
width=100% border=0></TD>
</TR>

<TR><TD>
<TABLE height="100%" cellSpacing=0 cellPadding=0 border=0
width="100%">
<TBODY>
<TR vAlign=top>
<TD height="100%" rowspan=3 width=149 bgcolor="#003366">
<TABLE height="100%" cellSpacing=0 cellPadding=0 width=149 align=left
border=0>
<TBODY>
<TR vAlign=top height="100%">
<TD vAlign=top height="100%">

<A href="home.htm"><IMG height=30 src="image/home2_icon.jpg" width=149
border=0 name=main01></A>

<A onmouseover="rollOver('main02')" onmouseout="rollOut('main02')"
href="project.php" target=_self><IMG height=30
src="image/research_icon.jpg" width=149 border=0 name=main02></A>

<A onmouseover="rollOver('main03')" onmouseout="rollOut('main03')"
href="publication.php" target=_self><IMG height=30
src="image/publication_icon.jpg" width=149 border=0 name=main03></A>

<A onmouseover="rollOver('main04')" onmouseout="rollOut('main04')"
href="award.php" target=_self><IMG height=30
src="image/award_icon.jpg" width=149 border=0 name=main04></A>

<A onmouseover="rollOver('main05')" onmouseout="rollOut('main05')"
href="people.php" target=_self><IMG height=30
src="image/people_icon.jpg" width=149 border=0 name=main05></A>

<A onmouseover="rollOver('main06')" onmouseout="rollOut('main06')"
href="gallery.php" target=_self><IMG height=30
src="image/gallery_icon.jpg" width=149 border=0 name=main06></A>
```



```

<A onmouseover="rollOver('main07')" onmouseout="rollOut('main07')"
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src="image/contact_icon.jpg" width=149 border=0 name=main07></A>

<A onmouseover="rollOver('main08')" onmouseout="rollOut('main08')"
href="link.php" target=_self><IMG height=30 src="image/link_icon.jpg"
width=149 border=0 name=main08></A>

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<SCRIPT language=javascript>
<!-- //

function rollOver(NAME) {
    imagesON = eval(NAME + "_on.src");
    document.images[NAME].src= imagesON;
}
function rollOut(NAME) {
    imageOFF = eval(NAME + "_off.src");
    document.images[NAME].src= imageOFF;
}

var main01_on = new Image(); main01_on.src = 'image/home2_icon.jpg';
var main01_off = new Image(); main01_off.src = 'image/home_icon.jpg';
var main02_on = new Image(); main02_on.src =
'image/research2_icon.jpg'; var main02_off = new Image();
main02_off.src = 'image/research_icon.jpg';
var main03_on = new Image(); main03_on.src =
'image/publication2_icon.jpg'; var main03_off = new Image();
main03_off.src = 'image/publication_icon.jpg';
var main04_on = new Image(); main04_on.src = 'image/award2_icon.jpg';
var main04_off = new Image(); main04_off.src = 'image/award_icon.jpg';
var main05_on = new Image(); main05_on.src = 'image/people2_icon.jpg';
var main05_off = new Image(); main05_off.src =
'image/people_icon.jpg';
var main06_on = new Image(); main06_on.src =
'image/gallery2_icon.jpg'; var main06_off = new Image();
main06_off.src = 'image/gallery_icon.jpg';
var main07_on = new Image(); main07_on.src =
'image/contact2_icon.jpg'; var main07_off = new Image();
main07_off.src = 'image/contact_icon.jpg';
var main08_on = new Image(); main08_on.src = 'image/link2_icon.jpg';
var main08_off = new Image(); main08_off.src = 'image/link_icon.jpg';

// -->
</SCRIPT>

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<IMG height=50 src="image/welcome_tab.jpg" width=100% border=0
name=main09><br><br>

```


<p>The Medical Image Processing Research Group is a research group at Neural Network Research Laboratory at Faculty of Computer Science & Information Technology, University of Malaya. The Lab is equipped with a combination of Dell Pentium 4 PCs, Gateway PIII PCs, Sun SPARC and Apple Macintosh computers and an array of imaging equipment such as Head Mounted Display (HMD) and Magneto Optical Disk (MOD) readers.</p>

<p>The Lab was established in 1996 when the faculty of was built. The lab became research source and development area for both undergraduates and postgraduates be it at the Masters or PhD levels.</p>

<p>For more information on our research, who we are, and the places we work, please follow the links on the left.</p>

</TD>

</TR>

</TBODY>

</TABLE>

</TD>

</TR>

</TBODY>

</TABLE>

</BODY>

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<!--project.php-->

<HTML>

<HEAD>

<TITLE>Medical Image Processing Research Group : Research Overview</TITLE>

</HEAD>

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width=149 border=0 name=main01></A>

<A href="project.php"><IMG height=30 src="image/research2_icon.jpg"
width=149 border=0 name=main02></A>

<A onmouseover="rollOver('main03')" onmouseout="rollOut('main03')"
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<A onmouseover="rollOver('main04')" onmouseout="rollOut('main04')"
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src="image/award_icon.jpg" width=149 border=0 name=main04></A>

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href="people.php" target=_self><IMG height=30
src="image/people_icon.jpg" width=149 border=0 name=main05></A>

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src="image/gallery_icon.jpg" width=149 border=0 name=main06></A>

<A onmouseover="rollOver('main07')" onmouseout="rollOut('main07')"
href="contact.php" target=_self><IMG height=30
src="image/contact_icon.jpg" width=149 border=0 name=main07></A>

<A onmouseover="rollOver('main08')" onmouseout="rollOut('main08')"
href="link.php" target=_self><IMG height=30 src="image/link_icon.jpg"
width=149 border=0 name=main08></A>

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<SCRIPT language=javascript>
<!-- //

function rollOver(NAME){
    imagesON = eval(NAME + "_on.src");
    document.images[NAME].src= imagesON;
}
function rollOut(NAME){
    imageOFF = eval(NAME + "_off.src");
    document.images[NAME].src= imageOFF;
}

var main01_on = new Image(); main01_on.src = 'image/home2_icon.jpg';
var main01_off = new Image(); main01_off.src = 'image/home_icon.jpg';
var main02_on = new Image(); main02_on.src =
'image/research2_icon.jpg'; var main02_off = new Image();
main02_off.src = 'image/research_icon.jpg';

```



```

var main03_on = new Image(); main03_on.src =
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main03_off.src = 'image/publication_icon.jpg';
var main04_on = new Image(); main04_on.src = 'image/award2_icon.jpg';
var main04_off = new Image(); main04_off.src = 'image/award_icon.jpg';
var main05_on = new Image(); main05_on.src = 'image/people2_icon.jpg';
var main05_off = new Image(); main05_off.src =
'image/people_icon.jpg';
var main06_on = new Image(); main06_on.src =
'image/gallery2_icon.jpg'; var main06_off = new Image();
main06_off.src = 'image/gallery_icon.jpg';
var main07_on = new Image(); main07_on.src =
'image/contact2_icon.jpg'; var main07_off = new Image();
main07_off.src = 'image/contact_icon.jpg';
var main08_on = new Image(); main08_on.src = 'image/link2_icon.jpg';
var main08_off = new Image(); main08_off.src = 'image/link_icon.jpg';

// -->
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<TR vAlign=top>
<TD vAlign=top height="100%">
<IMG height=30 src="image/research_tab.jpg" width=100%
border=0><br><br>
<font face=arial size=4pt><b>The Previous Research
Conducted</b></font><br><br>
<font face=arial>Among the research that was conducted in the lab over
the past few years are as follows :</font><br><br>

<?php

include ("config.php");

// Connect to the database server
$dbcnx = @mysql_connect($hostname, $root, $pass);
if (!$dbcnx) {
    echo( "<P>Unable to connect to the " .
        "database server at this time.</P>" );
    exit();
}

// Select the project database
if (! @mysql_select_db($database) ) {
    echo( "<P>Unable to locate the project " .
        "database at this time.</P>" );
    exit();
}

?>

<BLOCKQUOTE>
<?php
$researchlist = @mysql_query("SELECT rtitle, rresearcher, rdescription
FROM research WHERE status='previous' " );

```

```

while ($result = @mysql_fetch_array($researchlist)) {
    $title = $result["rtitle"];
    $researcher = $result["rresearcher"];
    $description = $result["rdescription"];

    // Display the award information
    echo("<p><ul><li>");
    echo("<font face=arial size=2pt><b>$title</b><br>");
    echo("$researcher<br>");
    echo("$description");
    echo("</font>");
    echo("</li></ul></p>");
}
?>

<br><br><font face=arial size=4pt><b>Current Research and
collaboration</b></font><br><br>
<font face=arial>The research that is currently in progress</font>
<?php
$researchlist = @mysql_query("SELECT rttitle, rresearcher, rdescription
FROM research WHERE status='current'");

while ($result = @mysql_fetch_array($researchlist)) {
    $title = $result["rttitle"];
    $researcher = $result["rresearcher"];
    $description = $result["rdescription"];

    // Display the award information
    echo("<p><ul><li>");
    echo("<font face=arial size=2pt><b>$title</b><br>");
    echo("$researcher<br>");
    echo("$description");
    echo("</font>");
    echo("</li></ul></p>");
}
?>
</BLOCKQUOTE>

</TD>
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<!--publication.php-->

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```

<TITLE>Medical Image Processing Research Group : Publications</TITLE>
</HEAD>

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href="home.htm" target=_self><IMG height=30 src="image/home_icon.jpg"
width=149 border=0 name=main01></A>

<A onmouseover="rollOver('main02')" onmouseout="rollOut('main02')"
href="project.php" target=_self><IMG height=30
src="image/research_icon.jpg" width=149 border=0 name=main02></A>

<A href="publication.php"><IMG height=30
src="image/publication2_icon.jpg" width=149 border=0 name=main03></A>

<A onmouseover="rollOver('main04')" onmouseout="rollOut('main04')"
href="award.php" target=_self><IMG height=30
src="image/award_icon.jpg" width=149 border=0 name=main04></A>

<A onmouseover="rollOver('main05')" onmouseout="rollOut('main05')"
href="people.php" target=_self><IMG height=30
src="image/people_icon.jpg" width=149 border=0 name=main05></A>

<A onmouseover="rollOver('main06')" onmouseout="rollOut('main06')"
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src="image/gallery_icon.jpg" width=149 border=0 name=main06></A>

<A onmouseover="rollOver('main07')" onmouseout="rollOut('main07')"
href="contact.php" target=_self><IMG height=30
src="image/contact_icon.jpg" width=149 border=0 name=main07></A>

<A onmouseover="rollOver('main08')" onmouseout="rollOut('main08')"
href="link.php" target=_self><IMG height=30 src="image/link_icon.jpg"
width=149 border=0 name=main08></A>

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<SCRIPT language=javascript>
<!-- //

function rollOver(NAME){
    imagesON = eval(NAME + "_on.src");
    document.images[NAME].src= imagesON;
}
function rollOut(NAME){
    imageOFF = eval(NAME + "_off.src");
    document.images[NAME].src= imageOFF;
}

var main01_on = new Image(); main01_on.src = 'image/home2_icon.jpg';
var main01_off = new Image(); main01_off.src = 'image/home_icon.jpg';
var main02_on = new Image(); main02_on.src =
'image/research2_icon.jpg'; var main02_off = new Image();
main02_off.src = 'image/research_icon.jpg';
var main03_on = new Image(); main03_on.src =
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main03_off.src = 'image/publication_icon.jpg';
var main04_on = new Image(); main04_on.src =
'image/award2_icon.jpg'; var main04_off = new Image(); main04_off.src
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var main05_on = new Image(); main05_on.src =
'image/people2_icon.jpg'; var main05_off = new Image(); main05_off.src
= 'image/people_icon.jpg';
var main06_on = new Image(); main06_on.src =
'image/gallery2_icon.jpg'; var main06_off = new Image();
main06_off.src = 'image/gallery_icon.jpg';
var main07_on = new Image(); main07_on.src =
'image/contact2_icon.jpg'; var main07_off = new Image();
main07_off.src = 'image/contact_icon.jpg';
var main08_on = new Image(); main08_on.src = 'image/link2_icon.jpg';
var main08_off = new Image(); main08_off.src = 'image/link_icon.jpg';

// -->
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<TR vAlign=top>
<TD vAlign=top height="100%">
<IMG height=30 src="image/publication_tab.jpg" width=100%
border=0><br><br>
<font face=arial>Numerous papers have been published be it in the
computer science journal or at conference. Among others they are
:</font><br>

<?php
include("config.php");

```

```

// Connect to the database server
$dbcnx = @mysql_connect($hostname, $user, $pass);
if (!$dbcnx) {
    echo( "<P>Unable to connect to the " .
        "database server at this time.</P>" );
    exit();
}

// Select the project database
if (! @mysql_select_db($database) ) {
    echo( "<P>Unable to locate the project " .
        "database at this time.</P>" );
    exit();
}

?>

<BLOCKQUOTE>

<?php
$publicationlist = mysql_query( "SELECT ptitle, pauthor, pdescription
FROM publication");

while ($result = mysql_fetch_array($publicationlist)) {
    $title = $result["ptitle"];
    $author = $result["pauthor"];
    $description = $result["pdescription"];

// Display the publication information
echo("<P>");
echo("<ul><li><font face=arial>$pauthor,<b> $title,</b><br>");
echo("$description($year)</font>");
echo("</li></ul><br>");
}

?>

</BLOCKQUOTE>
</TD>
</TR>
</TBODY>
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<!--award.php-->

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<TITLE>Medical Image Processing Research Group : Awards</TITLE>
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width=149 border=0 name=main01></A>

<A onmouseover="rollOver('main02')" onmouseout="rollOut('main02')"
href="project.php" target=_self><IMG height=30
src="image/research_icon.jpg" width=149 border=0 name=main02></A>

<A onmouseover="rollOver('main03')" onmouseout="rollOut('main03')"
href="publication.php" target=_self><IMG height=30
src="image/publication_icon.jpg" width=149 border=0 name=main03></A>
<A href="award.php"><IMG height=30 src="image/award2_icon.jpg"
width=149 border=0 name=main04></A>
<A onmouseover="rollOver('main05')" onmouseout="rollOut('main05')"
href="people.php" target=_self><IMG height=30
src="image/people_icon.jpg" width=149 border=0 name=main05></A>
<A onmouseover="rollOver('main06')" onmouseout="rollOut('main06')"
href="gallery.php" target=_self><IMG height=30
src="image/gallery_icon.jpg" width=149 border=0 name=main06></A>
<A onmouseover="rollOver('main07')" onmouseout="rollOut('main07')"
href="contact.php" target=_self><IMG height=30
src="image/contact_icon.jpg" width=149 border=0 name=main07></A>
<A onmouseover="rollOver('main08')" onmouseout="rollOut('main08')"
href="direction.php" target=_self><IMG height=30
src="image/link_icon.jpg" width=149 border=0 name=main08></A>
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<SCRIPT language=javascript>

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```

<!-- //
function rollOver(NAME){
    imagesON = eval(NAME + "_on.src");
    document.images[NAME].src= imagesON;
}

function rollOut(NAME){
    imageOFF = eval(NAME + "_off.src");
    document.images[NAME].src= imageOFF;
}

var main01_on = new Image(); main01_on.src = 'image/home2_icon.jpg';
var main01_off = new Image(); main01_off.src = 'image/home_icon.jpg';
var main02_on = new Image(); main02_on.src =
'image/research2_icon.jpg'; var main02_off = new Image();
main02_off.src = 'image/research_icon.jpg';
var main03_on = new Image(); main03_on.src =
'image/publication2_icon.jpg'; var main03_off = new Image();
main03_off.src = 'image/publication_icon.jpg';
var main04_on = new Image(); main04_on.src = 'image/award2_icon.jpg';
var main04_off = new Image(); main04_off.src = 'image/award_icon.jpg';
var main05_on = new Image(); main05_on.src = 'image/people2_icon.jpg';
var main05_off = new Image(); main05_off.src =
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var main06_on = new Image(); main06_on.src =
'image/gallery2_icon.jpg'; var main06_off = new Image();
main06_off.src = 'image/gallery_icon.jpg';
var main07_on = new Image(); main07_on.src =
'image/contact2_icon.jpg'; var main07_off = new Image();
main07_off.src = 'image/contact_icon.jpg';
var main08_on = new Image(); main08_on.src = 'image/link2_icon.jpg';
var main08_off = new Image(); main08_off.src = 'image/link_icon.jpg';

// -->
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</TR>

<TR vAlign=top>
<TD vAlign=top height="100%">
<IMG height=30 src="image/award_tab.jpg" width=100% border=0><br><br>
<font face=arial>Among the awards won for the research
work</font><br><br>

<?php
include ("config.php");

// Connect to the database server
$dbcnx = @mysql_connect($hostname, $root, $pass);
if (!$dbcnx) {
    echo( "<P>Unable to connect to the " .
        "database server at this time.</P>" );
    exit();
}

// Select the project database
if (! @mysql_select_db($database) ) {
    echo( "<P>Unable to locate the project " .

```



```

        "database at this time.</P>" );
    exit();
}

?>

<BLOCKQUOTE>

<?php
$awardlist = @mysql_query("SELECT atitle, projectTitle, adescription
FROM award" );

    while ($result = @mysql_fetch_array($awardlist)) {
        $title = $result["atitle"];
        $project = $result["projectTitle"];
        $description = $result["adescription"];

        // Display the award information
        echo("<p>");
        echo ("<ul><li><font face=arial><b>$title</b> for
$project<br>$description</font>");
        echo ("</li></ul></p>");
    }
?>

</BLOCKQUOTE>

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<!--people.php-->

<HTML>
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<TITLE>Medical Image Processing Research Group : People</TITLE>
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MARGINWIDTH="0">

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width="100%">
<TBODY>
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<TD height="100%" rowspan=3 width="149" bgcolor="#003366">

<TABLE height="100%" cellSpacing=0 cellPadding=0 width=149 align=left
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href="home.htm" target=_self><IMG height=30 src="image/home_icon.jpg"
width=149 border=0 name=main01></A>

<A onmouseover="rollOver('main02')" onmouseout="rollOut('main02')"
href="project.php" target=_self><IMG height=30
src="image/research_icon.jpg" width=149 border=0 name=main02></A>

<A onmouseover="rollOver('main03')" onmouseout="rollOut('main03')"
href="publication.php" target=_self><IMG height=30
src="image/publication_icon.jpg" width=149 border=0 name=main03></A>

<A onmouseover="rollOver('main04')" onmouseout="rollOut('main04')"
href="award.php" target=_self><IMG height=30
src="image/award_icon.jpg" width=149 border=0 name=main04></A>

<A href="people.php"><IMG height=30 src="image/people2_icon.jpg"
width=149 border=0 name=main05></A>

<A onmouseover="rollOver('main06')" onmouseout="rollOut('main05')"
href="gallery.php" target=_self><IMG height=30
src="image/gallery_icon.jpg" width=149 border=0 name=main06></A>

<A onmouseover="rollOver('main07')" onmouseout="rollOut('main07')"
href="contact.php" target=_self><IMG height=30
src="image/contact_icon.jpg" width=149 border=0 name=main07></A>

<A onmouseover="rollOver('main08')" onmouseout="rollOut('main08')"
href="link.php" target=_self><IMG height=30 src="image/link_icon.jpg"
width=149 border=0 name=main08></A>

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<SCRIPT language=javascript>
<!-- //

function rollOver(NAME) {

```



```

        imagesON = eval(NAME + "_on.src");
        document.images[NAME].src= imagesON;
    }
    function rollOut(NAME){
        imageOFF = eval(NAME + "_off.src");
        document.images[NAME].src= imageOFF;
    }

    var main01_on = new Image(); main01_on.src = 'image/home2_icon.jpg';
    var main01_off = new Image(); main01_off.src = 'image/home_icon.jpg';
    var main02_on = new Image(); main02_on.src =
    'image/research2_icon.jpg'; var main02_off = new Image();
    main02_off.src = 'image/research_icon.jpg';
    var main03_on = new Image(); main03_on.src =
    'image/publication2_icon.jpg'; var main03_off = new Image();
    main03_off.src = 'image/publication_icon.jpg';
    var main04_on = new Image(); main04_on.src = 'image/award2_icon.jpg';
    var main04_off = new Image(); main04_off.src = 'image/award_icon.jpg';
    var main05_on = new Image(); main05_on.src = 'image/people2_icon.jpg';
    var main05_off = new Image(); main05_off.src =
    'image/people_icon.jpg';
    var main06_on = new Image(); main06_on.src =
    'image/gallery2_icon.jpg'; var main06_off = new Image();
    main06_off.src = 'image/gallery_icon.jpg';
    var main07_on = new Image(); main07_on.src =
    'image/contact2_icon.jpg'; var main07_off = new Image();
    main07_off.src = 'image/contact_icon.jpg';
    var main08_on = new Image(); main08_on.src = 'image/link2_icon.jpg';
    var main08_off = new Image(); main08_off.src = 'image/link_icon.jpg';

    // -->
</SCRIPT>
</TD>
</TR>

<TR vAlign=top>
<TD vAlign=top height="100%">
<IMG height=30 src="image/people_tab.jpg" width=100% border=0><br><br>
<center><font face=arial size=4pt><b>Research
Supervisor</b></font></center>
<?php

include("config.php");

// Connect to the database server
$dbcnx = @mysql_connect($hostname, $user, $pass);
if (!$dbcnx) {
    echo( "<P>Unable to connect to the " .
        "database server at this time.</P>" );
    exit();
}

// Select the jokes database
if (! @mysql_select_db($database) ) {
    echo( "<P>Unable to locate the project " .
        "database at this time.</P>" );
    exit();
}

```

```

}

?>

<BLOCKQUOTE>

<?php

$peoplelist = mysql_query("SELECT peopleTitle, peopleName, peopleInfo,
researchArea, email, picName FROM people WHERE status='supervisor'");
while($result = mysql_fetch_array($peoplelist)) {
    $title = $result["peopleTitle"];
    $name = $result["peopleName"];
    $info = $result["peopleInfo"];
    $area = $result["researchArea"];
    $email = $result["email"];
    $pic = $result["picName"];

    // Display the pic with author information
    echo("<table border=1 cellpadding=0 cellspacing=0 width=100%>");
    echo("<tr>");
    echo("<td width=20% valign=top>");
    echo("<center><img height=100 width=80 src='image/$pic'
alt='$name'></center>");
    echo("</td>");
    echo("<td><font face=arial><b>$title $name</b><br><br>");
    echo("$info<br><br>");
    echo("<b>Areas of Research:</b><br>$area<br><br>");
    echo("E-mail: <A HREF='mailto:$email'>$email</A></font></td>");
    echo("</tr></table><br><br>");
}

?>

<center><font face=arial size=4pt><b>Research
Assistant</b></font></center>

<?php

$peoplelist = mysql_query("SELECT peopleTitle, peopleName, peopleInfo,
researchArea, email, picName FROM people WHERE status='research
assistant'");
while($result = mysql_fetch_array($peoplelist)) {
    $title = $result["peopleTitle"];
    $name = $result["peopleName"];
    $info = $result["peopleInfo"];
    $area = $result["researchArea"];
    $email = $result["email"];
    $pic = $result["picName"];

    // Display the pic with author information
    echo("<table border=1 cellpadding=0 cellspacing=0 width=100%>");
    echo("<tr>");
    echo("<td width=20% valign=top>");
    echo("<center><img height=100 width=80 src='image/$pic'
alt='$name'></center>");

```



```

echo ("</td>");
echo ("<td><font face=arial><b>$title $name</b><br><br>");
echo ("<td><font face=arial><b>$info<br><br>");
echo ("<b>Areas of Research:</b><br>$area<br><br>");
echo ("E-mail: <A HREF='mailto:$email'>$email</A></font></td>");
echo ("</tr></table>");
}

```

```

?>
</BLOCKQUOTE>

```

```

</TD>
</TR>
</TBODY>
</TABLE>
</TD>
</TR>
</TBODY>
</TABLE>
</BODY>
</HTML>

```

```

<!--gallery.php-->

```

```

<HTML><HEAD><TITLE>Medical Image Processing Research Group :
Gallery</TITLE>
</HEAD>

```

```

<BODY bgColor=#ffffff leftMargin=0 topMargin=0 MARGINHEIGHT="0"
MARGINWIDTH="0">

```

```

<TABLE height="100%" cellSpacing=0 cellPadding=0 border=0
width="100%">
<TBODY>

```

```

<TR vAlign=top>
<TD colspan=2 height=100> <IMG height=100 src="image/topheader.jpg"
width=100% border=0></TD>
</TR>

```

```

<TR><TD>
<TABLE height="100%" cellSpacing=0 cellPadding=0 border=0
width="100%">
<TBODY>

```

```

    <TR vAlign=top>
    <TD height="100%" rowspan=3 width="149" bgcolor="#003366">

```

```

<TABLE height="100%" cellSpacing=0 cellPadding=0 width=149 align=left
border=0>
<TBODY>
<TR vAlign=top height="100%">
<TD vAlign=top height="100%">

```

```

<A onmouseover="rollOver('main01')" onmouseout="rollOut('main01')"
href="home.htm" target=_self><IMG height=30 src="image/home_icon.jpg"
width=149 border=0 name=main01></A>

<A onmouseover="rollOver('main02')" onmouseout="rollOut('main02')"
href="project.php" target=_self><IMG height=30
src="image/research_icon.jpg" width=149 border=0 name=main02></A>

<A onmouseover="rollOver('main03')" onmouseout="rollOut('main03')"
href="publication.php" target=_self><IMG height=30
src="image/publication_icon.jpg" width=149 border=0 name=main03></A>

<A onmouseover="rollOver('main04')" onmouseout="rollOut('main04')"
href="award.php" target=_self><IMG height=30
src="image/award_icon.jpg" width=149 border=0 name=main04></A>

<A onmouseover="rollOver('main05')" onmouseout="rollOver('main05')"
href="people.php" target=_self><IMG height=30
src="image/people_icon.jpg" width=149 border=0 name=main05></A>

<A href="gallery.php"><IMG height=30 src="image/gallery2_icon.jpg"
width=149 border=0 name=main06></A>

<A onmouseover="rollOver('main07')" onmouseout="rollOver('main07')"
href="contact.php" target=_self><IMG height=30
src="image/contact_icon.jpg" width=149 border=0 name=main07></A>

<A onmouseover="rollOver('main08')" onmouseout="rollOver('main08')"
href="link.php" target=_self><IMG height=30 src="image/link_icon.jpg"
width=149 border=0 name=main08></A>

</TD>
</TR>
</TBODY>
</TABLE>

<SCRIPT language=javascript>
<!-- //

function rollOver(NAME){
    imagesON = eval(NAME + "_on.src");
    document.images[NAME].src= imagesON;
}
function rollOut(NAME){
    imageOFF = eval(NAME + "_off.src");
    document.images[NAME].src= imageOFF;
}

var main01_on = new Image(); main01_on.src = 'image/home2_icon.jpg';
var main01_off = new Image(); main01_off.src = 'image/home_icon.jpg';
var main02_on = new Image(); main02_on.src =
'image/research2_icon.jpg'; var main02_off = new Image();
main02_off.src = 'image/research_icon.jpg';
var main03_on = new Image(); main03_on.src =
'image/publication2_icon.jpg'; var main03_off = new Image();
main03_off.src = 'image/publication_icon.jpg';

```



```

var main04_on = new Image(); main04_on.src = 'image/award2_icon.jpg';
var main04_off = new Image(); main04_off.src = 'image/award_icon.jpg';
var main05_on = new Image(); main05_on.src = 'image/people2_icon.jpg';
var main05_off = new Image(); main05_off.src =
'image/people_icon.jpg';
var main06_on = new Image(); main06_on.src =
'image/gallery2_icon.jpg'; var main06_off = new Image();
main06_off.src = 'image/gallery_icon.jpg';
var main07_on = new Image(); main07_on.src =
'image/contact2_icon.jpg'; var main07_off = new Image();
main07_off.src = 'image/contact_icon.jpg';
var main08_on = new Image(); main08_on.src = 'image/link2_icon.jpg';
var main08_off = new Image(); main08_off.src = 'image/link_icon.jpg';

```

```
// -->
```

```
</SCRIPT>
```

```
</TD>
```

```
</TR>
```

```
<TR vAlign=top>
```

```
<TD vAlign=top>
```

```
<IMG height=30 src="image/gallery_tab.jpg" width=100%
border=0><br><br>
```

```
<?php
```

```
include("config.php");
```

```
// Connect to the database server
```

```
$dbcnx = @mysql_connect($hostname, $user, $pass);
```

```
if (!$dbcnx) {
```

```
    echo( "<P>Unable to connect to the " .
        "database server at this time.</P>" );
    exit();
}
```

```
// Select the research database
```

```
if (! @mysql_select_db($database) ) {
    echo( "<P>Unable to locate the research " .
        "database at this time.</P>" );
    exit();
}
```

```
?>
```

```
<?php
```

```
$imagelist = mysql_query("SELECT imageTitle, projectTitle,
imageDescription, imageName FROM gallery");
```

```
while ($result = mysql_fetch_array($imagelist)) {
    $title = $result["imageTitle"];
    $info = $result["imageDescription"];
    $project = $result["projectTitle"];
    $pic = $result["imageName"];

```

```
// Display the image with image information
echo ("<center><table width=50% border=1 cellpadding=0 cellspacing=0>");
echo ("<tr><td width=100% align=center><img width=200 height=200
src='gallery/$pic' alt='$title'></td></tr>");
echo ("<tr><td width=100% align=center><font
face=arial>$pic<br>$info</font></td></tr>");
echo ("</tr><br>");
}
```

```
?>
```

```
</TD>
</TR>
</TBODY>
</TABLE>
```

```
</TD>
</TR>
```

```
</TBODY>
</TABLE>
```

```
</BODY>
</HTML>
```

```
<!--contact.php-->
```

```
<HTML>
<HEAD>
```

```
<TITLE>Medical Image Processing Research Group : Contact
Information</TITLE></HEAD>
```

```
<BODY bgColor=#ffffff leftMargin=0 topMargin=0 MARGINHEIGHT="0"
MARGINWIDTH="0">
```

```
<TABLE height="100%" cellSpacing=0 cellPadding=0 border=0
width="100%">
<TBODY>
```

```
<TR vAlign=top>
<TD height=100><IMG height=100 src="image/topheader.jpg" width=100%
border=0></TD>
</TR>
```

```
<TR>
<TD>
```

```
<TABLE height="100%" cellSpacing=0 cellPadding=0 border=0
width="100%">
<TBODY>
<TR vAlign=top>
<TD height="100%" rowSpan=3 width="149" bgcolor="#003366">
```



```

<TABLE height="100%" cellSpacing=0 cellPadding=0 width=149
align=left border=0>
<TBODY>
<TR vAlign=top height="100%">
<TD vAlign=top height="100%">
<A onmouseover="rollOver('main01')" onmouseout="rollOut('main01')"
href="home.htm" target=_self><IMG height=30 src="image/home_icon.jpg"
width=149 border=0 name=main01></A>

<A onmouseover="rollOver('main02')" onmouseout="rollOut('main02')"
href="project.php" target=_self><IMG height=30
src="image/research_icon.jpg" width=149 border=0 name=main02></A>

<A onmouseover="rollOver('main03')" onmouseout="rollOut('main03')"
href="publication.php" target=_self><IMG height=30
src="image/publication_icon.jpg" width=149 border=0 name=main03></A>

<A onmouseover="rollOver('main04')" onmouseout="rollOut('main04')"
href="award.php" target=_self><IMG height=30
src="image/award_icon.jpg" width=149 border=0 name=main04></A>

<A onmouseover="rollOver('main05')" onmouseout="rollOut('main05')"
href="people.php" target=_self><IMG height=30
src="image/people_icon.jpg" width=149 border=0 name=main05></A>

<A onmouseover="rollOver('main06')" onmouseout="rollOut('main06')"
href="gallery.php" target=_self><IMG height=30
src="image/gallery_icon.jpg" width=149 border=0 name=main06></A>

<A href="contact.php" target=_self><IMG height=30
src="image/contact2_icon.jpg" width=149 border=0 name=main07></A>

<A onmouseover="rollOver('main08')" onmouseout="rollOut('main08')"
href="link.php" target=_self><IMG height=30 src="image/link_icon.jpg"
width=149 border=0 name=main08></A>

</TD>
</TR>
</TBODY>
</TABLE>

```

```

<SCRIPT language=javascript>
<!-- //

function rollOver(NAME){
    imagesON = eval(NAME + "_on.src");
    document.images[NAME].src= imagesON;
}
function rollOut(NAME){
    imageOFF = eval(NAME + "_off.src");
    document.images[NAME].src= imageOFF;
}
var main01_on = new Image(); main01_on.src = 'image/home2_icon.jpg';
var main01_off = new Image(); main01_off.src = 'image/home_icon.jpg';

```

```

var main02_on = new Image(); main02_on.src =
'image/research2_icon.jpg'; var main02_off = new Image();
main02_off.src = 'image/research_icon.jpg';
var main03_on = new Image(); main03_on.src =
'image/publication2_icon.jpg'; var main03_off = new Image();
main03_off.src = 'image/publication_icon.jpg';
var main04_on = new Image(); main04_on.src = 'image/award2_icon.jpg';
var main04_off = new Image(); main04_off.src = 'image/award_icon.jpg';
var main05_on = new Image(); main05_on.src =
'image/people2_icon.jpg'; var main05_off = new Image(); main05_off.src
= 'image/people_icon.jpg';
var main06_on = new Image(); main06_on.src =
'image/gallery2_icon.jpg'; var main06_off = new Image();
main06_off.src = 'image/gallery_icon.jpg';
var main07_on = new Image(); main07_on.src =
'image/contact2_icon.jpg'; var main07_off = new Image();
main07_off.src = 'image/contact_icon.jpg';
var main08_on = new Image(); main08_on.src = 'image/link2_icon.jpg';
var main08_off = new Image(); main08_off.src = 'image/link_icon.jpg';

// -->
</SCRIPT>
</TD>
</TR>

<TR vAlign=top>
<TD vAlign=top>
<IMG height=30 src="image/contact_tab.jpg" width=100%
border=0><br><br>
<font face=arial><b>Mailing Address :</b><br>
Neural Network Lab,<br>
Faculty of Computer Science & Information
Technology,<br>
University of Malaya,<br>
50603 Kuala Lumpur,
Malaysia<br><br>
<b>Phone Number:</b><br>
Lab :&nbsp;</font><font class=noir>03-
777777</font><br>
Fax :&nbsp;</font><font class=noir>03-
888888</font><br><br>

<?php
include ("config.php");

// Connect to the database server
$dbcnx = @mysql_connect($hostname, $root, $pass);

if (!$dbcnx) {
echo( "<P>Unable to connect to the database server at this time.</P>"
);
exit();
}

// Select the research database
if (! @mysql_select_db($database) ) {

```



```

echo( "<P>Unable to locate the research database at this time.</P>"
);
exit();
}

?>

<font face=arial><b>E-mail Addresses:</b></font><br>

<?php

$emaillist = mysql_query("SELECT peopleTitle, peopleName, email FROM
people");

while ($emailadd = mysql_fetch_array($emaillist)) {
$title = $emailadd["peopleTitle"];
$name = $emailadd["peopleName"];
$email = $emailadd["email"];

// Display the email list
echo( "<font face=arial><b>$title $name</b> &nbsp; &nbsp; <A
HREF='mailto:$email'>$email</A></font><br><br>" );
}

?>

</TD>
</TR>
</TBODY>
</TABLE>

</TD>
</TR>

</TBODY>
</TABLE>

</BODY>
</HTML>

<!--link.php-->

<HTML>
<HEAD>
<TITLE>Medical Image Processing Research Group : Related Link</TITLE>
<LINK href="style01.css" type=text/css rel=stylesheet>
</HEAD>

<BODY bgColor=#ffffff leftMargin=0 topMargin=0 MARGINHEIGHT="0"
MARGINWIDTH="0">

<TABLE height="100%" cellSpacing=0 cellPadding=0 border=0
width="100%">

```

```

<TBODY>
<TR vAlign=top>
<TD colspan=2 height=100><IMG height=100 src="image/topheader.jpg"
width=100% border=0></TD>
</TR>

<TR><TD>
<TABLE height="100%" cellSpacing=0 cellPadding=0 border=0
width="100%">
<TBODY>
<TR vAlign=top>
<TD height="100%" rowspan=3 width="149" bgcolor="#003366">

<TABLE height="100%" cellSpacing=0 cellPadding=0 width=149 align=left
border=0>
<TBODY>
<TR vAlign=top height="100%">
<TD vAlign=top height="100%">

<A onmouseover="rollOver('main01')" onmouseout="rollOut('main01')"
href="home.htm" target=_self><IMG height=30 src="image/home_icon.jpg"
width=149 border=0 name=main01></A>

<A onmouseover="rollOver('main02')" onmouseout="rollOut('main02')"
href="project.php" target=_self><IMG height=30
src="image/research_icon.jpg" width=149 border=0 name=main02></A>

<A onmouseover="rollOver('main03')" onmouseout="rollOut('main03')"
href="publication.php" target=_self><IMG height=30
src="image/publication_icon.jpg" width=149 border=0 name=main03></A>

<A onmouseover="rollOver('main04')" onmouseout="rollOut('main04')"
href="award.php" target=_self><IMG height=30
src="image/award_icon.jpg" width=149 border=0 name=main04></A>

<A onmouseover="rollOver('main05')" onmouseout="rollOut('main05')"
href="people.php" target=_self><IMG height=30
src="image/people_icon.jpg" width=149 border=0 name=main05></A>

<A onmouseover="rollOver('main06')" onmouseout="rollOut('main06')"
href="gallery.php" target=_self><IMG height=30
src="image/gallery_icon.jpg" width=149 border=0 name=main06></A>

<A onmouseover="rollOver('main07')" onmouseout="rollOut('main07')"
href="contact.php" target=_self><IMG height=30
src="image/contact_icon.jpg" width=149 border=0 name=main07></A>

<A href="link.php" target=_self><IMG height=30
src="image/link2_icon.jpg" width=149 border=0 name=main08></A>

</TD>
</TR>
</TBODY>
</TABLE>

<SCRIPT language=javascript>
<!-- //

```



```

function rollOver(NAME){
    imagesON = eval(NAME + "_on.src");
    document.images[NAME].src= imagesON;
}
function rollOut(NAME){
    imageOFF = eval(NAME + "_off.src");
    document.images[NAME].src= imageOFF;
}

var main01_on = new Image(); main01_on.src = 'image/home2_icon.jpg';
var main01_off = new Image(); main01_off.src = 'image/home_icon.jpg';
var main02_on = new Image(); main02_on.src =
'image/research2_icon.jpg'; var main02_off = new Image();
main02_off.src = 'image/research_icon.jpg';
var main03_on = new Image(); main03_on.src =
'image/publication2_icon.jpg'; var main03_off = new Image();
main03_off.src = 'image/publication_icon.jpg';
var main04_on = new Image(); main04_on.src = 'image/award2_icon.jpg';
var main04_off = new Image(); main04_off.src = 'image/award_icon.jpg';
var main05_on = new Image(); main05_on.src =
'image/people2_icon.jpg'; var main05_off = new Image(); main05_off.src
= 'image/people_icon.jpg';
var main06_on = new Image(); main06_on.src =
'image/gallery2_icon.jpg'; var main06_off = new Image();
main06_off.src = 'image/gallery_icon.jpg';
var main07_on = new Image(); main07_on.src =
'image/contact2_icon.jpg'; var main07_off = new Image();
main07_off.src = 'image/contact_icon.jpg';
var main08_on = new Image(); main08_on.src = 'image/link2_icon.jpg';
var main08_off = new Image(); main08_off.src = 'image/link_icon.jpg';

// -->
</SCRIPT>
</TD>
</TR>

<TR vAlign=top>
<TD vAlign=top height="100%">
<IMG height=30 src="image/link_tab.jpg" width=100% border=0><br><br>

<?php
include("config.php");
// Connect to the database server
$dbcnx = @mysql_connect($hostname, $user, $pass);
if (!$dbcnx) {
echo( "<P>Unable to connect to the " .
        "database server at this time.</P>" );
exit();
}

// Select the research database
if (! @mysql_select_db($database) ) {
    echo( "<P>Unable to locate the research " .
        "database at this time.</P>" );
    exit();
}

```

?>

<BLOCKQUOTE>

<?php

\$linklist = @mysql_query("SELECT organization, linkAdd FROM link");

while (\$result = @mysql_fetch_array(\$linklist)) {

 \$organization = \$result["organization"];

 \$link = \$result["linkAdd"];

// Display the link with the name of the organization

echo("<p>");

echo("\$organization
");

echo ("\$link");

echo ("</p>");

}

?>

</BLOCKQUOTE>

</TD>

</TR>

</TBODY>

</TABLE>

</TD>

</TR>

</TBODY>

</TABLE>

</BODY>

</HTML>

REFERENCE

Books

1. Alharbi, Fadi, ed. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
2. Brown, R., and Gao, S., eds. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
3. Calvino, T., and Koyuncu, A. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
4. Calvino, T., and Koyuncu, A. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
5. Calvino, T., and Koyuncu, A. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
6. Calvino, T., and Koyuncu, A. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
7. Calvino, T., and Koyuncu, A. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
8. Calvino, T., and Koyuncu, A. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
9. Calvino, T., and Koyuncu, A. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>
10. Calvino, T., and Koyuncu, A. (2019). *Blockchain Technology: An Overview of the State of the Field*. Emerald Group Publishing, 76. <https://doi.org/10.1016/j.chbs.2019.05.001>

REFERENCE

REFERENCE

Books

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